

Original Research Article

A cross-sectional observational study assessing the clinical profile of patients with iron deficiency anaemia

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ABSTRACT

Background: Our objective in this research was to study the clinical profile of patients having iron deficiency anaemia.

Methods: This was an observational cross sectional study conducted in Medicine out-patient and in-patient departments of Baroda Medical College and SSG Hospital, Vadodara from February, 2018 to November, 2018 and included all patients (N=50) above eighteen years of age who were diagnosed on admission with microcytic hypochromic or normocytic normochromic anaemia. Following detailed history, general examination and basic haematological investigations like complete blood count, haemoglobin, mean corpuscular volume, etc., statistical analysis of the data was performed.

Results: In the present study, it was found that maximum number of patients belonged to a younger age group (mean=36.82 years) with a majority being females (74%). Most common presenting complaint was weakness seen in 96% cases while the commonest clinical finding was pallor present in 100% cases followed by koilonychia in 32%. The most common cause of iron deficiency anaemia was nutritional seen in 60% patients.

Conclusions: Generalised weakness, breathlessness, and pedal edema were the commonest presenting complaints in our study while pallor, koilonychia, and pedal edema were the most common clinical findings. Maximum number of patients had IDA due to a nutritional cause. Chronic gastrointestinal bleeding, inflammatory bowel disease, and menorrhagia are other causes of IDA. Amongst addicted, alcohol addiction seen in most cases.

Keywords: Diagnosis, Iron deficiency anaemia, Reticulocyte haemoglobin content

INTRODUCTION

Anaemia is a decrease in the total amount of red blood cells (RBCs) or haemoglobin in the blood, or a lowered ability of the blood to carry oxygen.¹⁻³ Iron deficiency anaemia is one of the most common nutrient deficiencies and a leading cause of anaemia worldwide and especially India.⁴ WHO criteria for diagnosing IDA consist of Hb <12 gram/decilitre (females), Hb <13 gram/decilitre (males), and mean corpuscular volume (MCV) <80 femtolitres (with previously documented normal MCV).⁵

The National Family Health Survey-4 (NFHS-4) data suggests that anaemia is widely prevalent among all age groups with 58 per cent among lactating women, 50.4 per cent among pregnant women and 52.3 per cent in non-pregnant non-lactating women. 54.1 per cent adolescent girls (15–19 years) and 29.2 per cent adolescent boys are anaemic. Prevalence among children below 5 years ranges from 45 to 70 per cent and it peaks from 12 to 17 months of age affecting 71 per cent of the population. Over a period of ten years, from NFHS-3 in 2005-06 to NFHS-4 in 2015-16, anaemia prevalence has

changed only meagrely from 55% to 53% among women and 24% to 23% among men.⁶ Iron deficiency anaemia is a major public health problem in India as it not only adversely affects the health of the patient but in case of pregnant females, affects the baby's health as well by increasing the incidence of preterm labor, low birth weight, and infant mortality.⁷ Low iron intake in diet due to vegetarianism and poor socioeconomic status, decreased absorption of iron from the intestine due to infective diarrhoeal diseases, and increased blood loss secondary to hookworm infestation, heavy menstruation bleeding, and childbirth are some common causes of IDA in India.

In this study, our objective is to find the prevalence of IDA in adult patients coming to our tertiary care hospital and to study the clinical profile of these patients in terms of presenting complaints, clinical findings, aetiology, severity, and addiction history.

METHODS

This was an observational cross sectional study conducted in Medicine out-patient and in-patient departments of Baroda Medical College and SSG Hospital, Vadodara over a period of ten months, from February, 2018 to November, 2018 and included all patients (n=50) above eighteen years of age of either gender who were diagnosed on admission with microcytic hypochromic or normocytic normochromic anaemia. Haemoglobin levels less than 12 gram/decilitre taken as cut-off for anaemia in females and less than 13 gram/decilitre for males. Exclusion criteria consisted of patients with anaemia secondary to acute blood loss, macrocytic anaemia, and anaemia with dimorphic picture as diagnosed by peripheral smear at the Pathology department of our set-up. Patients on haematinics and pregnant females as elicited by history were also excluded along with patients who refused to give consent.

After obtaining approval from the institutional ethics committee and taking a well-informed written consent, all participants were subjected to standardised interview which consisted of demographic data, symptoms of generalised weakness, easy fatiguability, dyspnea on exertion, palpitation, pedal oedema, yellow discolouration, diarrhoea, etc., menstrual and obstetric history for females, past history for major illnesses, and personal history including diet, appetite, sleep, addiction, etc. Clinical examination of patients done for findings pertaining to anaemia such as poor nourishment, tachycardia, pallor, koilonychia, etc. Complete blood count including haemoglobin (Hb), total leukocyte count (TLC), platelet count, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), and red cell distribution width (RDW) was performed by optical measurement method on Horiba haematology analyser. Erythrocyte sedimentation rate (ESR) by Wintrobe method, random blood sugar (RBS) by glucose

oxidase-peroxidase method, and bilirubin (total, direct, indirect) by diazotized sulphanilic acid were performed in Robonik Prietest Touch Biochemistry Analyser. Stool examination by light microscope and electrocardiogram (ECG) were also done. The severity of anaemia has been classified according to the WHO criteria which states that mild anaemia is with Hb between 11 to 11.9 g/dl in females and 11 to 12.9 g/dL in males, moderate with Hb between 8 to 10.9 g/dl and severe anaemia if Hb is less than 8 g/dl.⁸

Sample size (N=50) of this study was calculated with the help of previously published papers keeping the p value at <0.05 and power of study at 80%. All the data was analysed using appropriate statistical tests. A p value of <0.05 was considered significant assuming normal distribution of dependent variables and randomisation of independent variables. Qualitative data was expressed in percentage and quantitative data was expressed as mean \pm standard deviation. Data was entered with the help of Microsoft Word and Excel and analysed by MedCalc Software Version 12.5.0.

RESULTS

There were 22 cases (i.e. 44% of all cases) in the range of 18-30 years and 8 cases (i.e. 16% of all cases) between 31-40 years. Age group from 41-50 years had 12 cases (i.e. 24% of all cases), 51-60 years had 7 cases (i.e. 14% of all cases) while the age groups from 61-70 and 71-80 years both had 1 case each (i.e. 2 % each of all cases). Hence majority of our cases belonged to the age group of 18-50 years which comprised of 42 cases (i.e. 84% of all cases). Mean age in our study was 36.82 years. Out of 50 patients, 37 were females (i.e. 74%) and 13 were males (i.e. 26%). Except for the age group of 61-70 years, females were predominant across all age groups. Maximum number of female cases belonged to the age group of 18-30 years with 17 cases (i.e. 34% of all cases) followed by 31-50 years comprising of 15 cases (i.e. 30% of all cases). Maximum number of patients belonged to a younger age group (mean = 36.82 years) with a majority being females (74%) (Table 1).

Table 1: Age and sex distribution in IDA.

Age (years)	No. of patients	%	Female	%	Male	%
18-30	22	44	17	34	5	10
31-40	8	16	7	14	1	2
41-50	12	24	8	16	3	6
51-60	7	14	4	8	3	6
61-70	1	2	0	0	1	2
71-80	1	2	1	2	0	0
18-80	50	100	37	74	13	26

Most common presenting complaint was weakness seen in 48 cases (i.e. 96%) followed by breathlessness seen in 29 cases (i.e. 58%) and pedal oedema in 12 cases (i.e. 24%). Chronic bleeding was seen in 8 patients (16%),

palpitations, diarrhoea and yellowish discolouration of urine and sclera in 5 patients (10%) each and worms in stool in 1 patient (2%) (Table 2).

Table 2: Presenting symptoms in IDA.

Presenting symptoms	No. Of cases	Percentage (%)
Weakness	48	96
Breathlessness	29	58
Pedal edema	12	24
Bleeding	8	16
Palpitations	5	10
Jaundice	5	10
diarrhoea	5	10
Worms in stool	1	2

In present study, the commonest clinical finding was pallor, which was present in all 50 cases (i.e. 100%) followed by koilonychia in 18 cases (i.e. 32%), then pedal oedema in 12 cases (i.e. 24%), icterus (10%), hepatomegaly (6%), splenomegaly (6%) and lymphadenopathy (4%) (Table 3).

Table 3: Physical findings in IDA.

Physical findings	No. of cases	Percentage
Pallor	50	100
Koilonychias	18	32
Pedal edema	12	24
Icterus	5	10
Hepatomegaly	3	6
splenomegaly	3	6
Lymphadenopathy	2	4

Table 4: Aetiology of IDA.

Etiology	Cases	Percentage
Nutritional	30	60
Chronic gastrointestinal blood loss in form of malaena	8	16
Inflammatory Bowel Disease	5	10
Menorrhagia	4	8
Hookworm infestation	3	6

The most common cause of iron deficiency anemia was nutritional seen in 30 cases (i.e. 60%) followed by chronic gastrointestinal loss in the form of malaena in 8 cases (16%), inflammatory Bowel disease in 5 cases (10%), menorrhagia in 4 cases (8%) and lastly, by hookworm infestation in 3 cases (6%).

Majority of the cases (35 cases, i.e. 70%) were not addicted. Amongst addicted, alcohol addiction was seen in maximum number of cases which is 10 cases (i.e. 20%) followed by smoking and tobacco in 3 cases each (6% each).

In this study, there were 45 cases (i.e. 90%) with severe anaemia, 5 cases (i.e. 10%) with moderate anaemia and no case with mild anaemia. Out of 13 male patients, 2 had moderate anaemia and 11 had severe anaemia. Out of 37 females, 3 had moderate anaemia and 36 females had severe anaemia.

DISCUSSION

In the present study, it was found that maximum number of patients belonged to a younger age group with mean age 36.82 years. There is a difference in observation with previous studies that encountered a younger population. Sudhir et al had conducted a hospital based analytical study with 102 patients and derived the mean age of 35.63±15.96 for group A with grade 0 and 1 iron depleted stores.⁴ Beatriz A et al had collected peripheral blood cells from 117 adult patients with anemia and got the mean age of 42 years with a range of 16-82 years.⁹ Ali Shah SZ et al had maximum population 50 patients and had mean age of 48.87±7.85.¹⁰ Majority of patients in our study were females irrespective of age. This could be due a high level of malnutrition, increased loss of menstrual blood in menorrhagia, blood loss during childbirth and lactation. Ali Shah et al had almost equal sex distribution of 27 cases of males (i.e. 54%) and 23 cases of females (i.e. 46%).¹⁰ Nareddy VA et al had taken stage 1 as iron deplete group and stage 2 as iron deficient erythropoiesis of which we used stage 1 to compare the results with our study.¹¹ Out of 50 cases in stage 1, 30 were female (i.e. 60%) and 20 male cases (i.e. 40%). Sudhir et al had 102 study participants with 34% males and 66% females. (Male: female ratio 1:1.83).⁴ Beatriz et al had a sex ratio of male/ female of 26.2/73.8 suggesting a female predominance.⁹ Hence, the results in all the studies were in consistency with my present study.

In our study, the most common presenting symptoms in patients with iron deficiency anaemia were generalised weakness with easy fatigueability followed by breathlessness, pedal edema and palpitations. Milind et al^[12] had the most common presenting symptom of easy fatigueability in 80% almost same as in my study followed by breathlessness in 76%, palpitations in 64%, swelling of feet in 40% and chest pain. Ali Shah et al had tiredness in 42% cases, followed by breathlessness in 30%.¹⁰ Rinku et al had the most common presenting symptom of weakness in 83 cases (i.e. in 47%), shortness of breath in 7 cases (i.e. in 4%).¹³ Therefore, the results in all the above mentioned studies are consistent with the present study. Pallor was the most common physical finding in a patient with iron deficiency anaemia followed by pedal oedema and koilonychias in the present study. Milind et al found pallor in 94% cases, almost same as in our study followed by pedal oedema in 40%, koilonychias in 20%, icterus in 18%.¹² Rinku et al had most common physical finding of pallor in 90% cases followed by pedal oedema and koilonychias and icterus.¹³ Hence, the results in the above studies and in our study are in consistency.

Table 5: Comparison with previous studies.

Study	Mean age in years	Sex distribution	Most common presenting symptom	Most common physical finding	Most common cause	Severity
Sudhir et al ⁴	35.63±15.96	34% males and 66% females				71.6% grade 0, 9.8% grade 1, 7.8% grade 2, and 10.8% grade 3 stainable iron
Beatriz et al ⁹	42 years with a range of 16-82 years	Male/ female of 26.2/73.8				
Ali Shah et al ¹⁰	48.87±7.85	54% males and 46% females	Tiredness in 42% cases		<i>Helicobacter pylori</i> infection in 23.8%	
Nareddy et al ¹¹	53.26	40% males and 60% females				38% stage 1, 32% stage 2, and 30% in normal stage.
Milind et al ¹²	64% above 40 years of age	46% males and 54% females	Easy fatigueability in 80% cases	Pallor in 94% cases	Nutritional cause in 50%	
Rinku et al ¹³	52.61±15.441	22% males and 78% females	Weakness in 47% cases	Pallor in 90% cases	Nutritional cause in 50.3%	Moderate anaemia (46.9%), severe anaemia (26.9%), mild anaemia (17.1%), and life threatening (9.1%)
Our study	36.82 years	26% males and 74% females	Weakness in 96% cases	Pallor in 100%	Nutritional cause in 60%	90% severe anaemia, 10% moderate anaemia, and no case with mild anaemia

The most common aetiology of iron deficiency anaemia was due to nutritional deficiencies followed by inflammatory bowel diseases, chronic systemic illness, menorrhagia, malaena and hookworm infestation. Milind et al also found nutritional cause leading to iron deficiency anaemia in 50% cases followed by chronic systemic diseases in 30% cases, then inflammatory bowel disease in 10% cases.¹² Hence, the findings in my study are in consistency with Milind's study. In the present study, maximum patients had severe anaemia with 46 cases (i.e. 96%), 4 cases (i.e. 8%) had moderate anaemia and no case with mild anaemia.

Mean age in all studies, except Sudhir et al, is more than the mean age in our study.⁴ In all studies except Zulfiqar Ali Shah et al, female patients predominate.¹⁰ Weakness and pallor are the most common presenting symptom and sign respectively in all studies. Nutritional cause forms the major cause of IDA across all studies except in Zulfiqar Ali Shah et al.¹⁰ Our study has 90% patients of severe IDA and zero patients of mild IDA which may produce skewed results (Table 5).

Majority population in the study had no addiction history. But among the addicted, iron deficiency was more commonly seen in alcoholism than smokers or tobacco chewers. Alcohol addiction can lead to malnutrition, malabsorption, chronic blood loss in form of malaena

through oesophageal varices or gastric ulcers, all of which contribute gradually to iron deficiency anaemia.

Our study had some limitations. We included patients with severe anaemia in our study. Whether our findings can be extrapolated to those with mild to moderate degree of anaemia or with iron deficient states is debatable. This study was done at a tertiary care centre, and recruited admitted patients only resulting in a limited sample size, thus the nature of the investigation and the results do not imply a general case, and further studies with a larger sample size are needed.

CONCLUSION

In our study, generalised weakness, breathlessness, and pedal edema were the commonest presenting complaints while pallor, koilonychia, and pedal edema were the most common clinical findings. Maximum number of patients had IDA due to a nutritional cause. Chronic gastrointestinal bleeding, inflammatory bowel disease, menorrhagia, and hookworm infestation were other causes of IDA. Amongst addicted, alcohol addiction was seen in most cases.

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