

IRON DEFICIENCY ANAEMIA IN WOMEN OF REPRODUCTIVE AGE GROUP ATTENDING A TERTIARY CARE HOSPITAL

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ABSTRACT

Anaemia is defined as a clinical condition characterized by reduction in hemoglobin concentration below the normal age, sex, physiological condition and altitude from the sea level, of a person. It can be of different types, the commonest being iron deficiency anaemia, due to low iron intake, affects growing children, mostly pregnant and lactating females. Present study was undertaken at Major S.D. Singh Medical College hospital, Farrukhabad. One hundred patients attending Out-patient department were selected for the study. Detailed history was recorded, clinical examination conducted, blood tests including full blood count, platelet count, absolute blood values and blood film examination. In all patients having anaemia, serum ferritin was also estimated. Results showed that majority of patients (40%) were in the age group of 20-25 years. Largest number (43%) were suffering from moderate anaemia. 72% were having microcytic hypochromic anaemia, suggestive of low iron intake. Mean Ferritin level in cases of moderate anaemia was 10.8U/L (Normal value- 63ug/L), much below the normal values. Present study re-confirms that iron deficiency anaemia, which is linked with poor dietary intake, during vital period of life, is still a problem. Target group, particularly females of reproductive age-group, needs focused attention to improve the scenario, which will minimize consequences of anemia.

KEYWORDS : Anaemia in Pregnancy, Hemoglobin Levels, Iron Deficiency Anaemia, Serum ferritin

Anemia is defined as a clinical condition characterized by reduction in haemoglobin concentration of blood below the normal for the age, sex, physiological condition and altitude above sea level, of that person.

Anemia is a global problem of immense health significance affecting persons of all ages and economic groups. It has been estimated that 20% of the world's population is iron deficient. Iron deficiency anemia is the most common type of anemia met with in clinical practice. It occurs at all ages, but is especially common in women of child bearing age, in whom it is an important cause of chronic fatigue and ill health (Farkin, 2008). During the reproductive life of the female, menstruation, pregnancy, parturition and lactation significantly increase the physiological requirements of iron.

In pregnant women WHO defined Anemia as a reduction in Haemoglobin level <11g/dl. It occurs in 40-80% of the pregnant women. Iron and Folic acid deficiencies, malaria, intestinal parasitic infections and hemoglobinopathies are the principal causes of anemia in pregnancy (Meda et. al., 1999). Haemoglobin level at or below 9 gm/dl require detailed investigations and appropriate treatment. Iron deficiency anaemia is the most common type of anaemia throughout the world and

according to Muhammad Idris and Rehman (2005), when iron deficiency is widespread and severe, the prevalence of morbidity and effects on the individuals resistance to infectious disease are significant. It has been reported to affect about 50-60% of young children and pregnant females and 20-30% of non pregnant females in the developing countries. Iron deficiency anaemia is reportedly the most common cause of anaemia in general medical practice (Andrew et al., 2009).

It is one of the leading nutritional deficiencies in the world particularly in developing countries, when iron deficiency is sufficiently severe, the haemoglobin concentration in the blood decreases leading to iron deficiency anaemia, which has negative health consequences especially in children, pregnant women and adolescents. Hence women with inadequate stores are at increased risks of developing iron deficiency anaemia during pregnancy (Chandyo et al., 2006).

Gorden et al., (1990) have shown that serum ferritin is the best investigation for distinguishing those with iron deficiency from those who were not iron deficient. Appropriate use of serum ferritin would refute diagnosis of iron deficiency without a bone marrow aspirate in 70% of patients. Some author found that marrow iron stores were

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absent in 32% of 38 years old females. Anemia in pregnancy is common, this is related to increased demands of iron during pregnancy, pre-existing negative iron balance due to frequent pregnancies, menstrual blood losses, dietary inadequacies, helminthiasis and amoebiasis are important contributory factors,

Highest incidence of IDA is seen in women of reproductive age. The incidence is much higher in underdeveloped countries to developed countries (Sadeghipour et al., 1996). According to WHO, in developing countries the prevalence of anaemia among pregnant women averages 56%, ranging between 35 to 100% among different regions of the world. Various studies from different regions of India have reported the prevalence of anaemia to be between 33 and 100%. Dutta (2006) reported that, incidence of nutritional anemia in reproductive age groups ranges from 60-80% in India compared to 10-20% in developed countries (Dutta, 2006) .

In India, anaemia is the second most common cause of maternal deaths accounting for 20% of total maternal deaths. Anaemia affects mainly the women in child bearing age group, young children and adolescent girls. Association of anaemia with adverse maternal outcome such as puerperal sepsis, ante-partum haemorrhage, post-partum haemorrhage and maternal mortality is an established fact beyond doubt. Apart from the risk to the mother, it is also responsible for increased incidence of premature births, low birth weight babies and high perinatal mortality (Gautam et al., 2002). Anemia is responsible for 20% maternal deaths in the third world countries (Dutta, 2006).

The single most important cause for the widespread Iron deficiency anemia in our country is inadequate iron intake in the habitual diets compared with the poor bioavailability of dietary iron (Gupta and Kalia, 2004).

Hence the present study is taken to evaluate the occurrence of Iron deficiency anemia among females of reproductive age group with due importance for assessing the serum ferritin levels.

MATERIALS AND METHODS

The present study was carried out in women of reproductive age group (20-40yrs) who attended the outpatient department from December 2013 to December 2014 at Major S. D. Singh Medical College and Hospital, Farrukhabad. Study was undertaken with the following aims and objectives;

- To evaluate the status of iron deficiency anaemia in women of reproductive age group.
- To know the proportion of iron deficiency anaemia in moderate to severe anaemic patients.

A detailed clinical history of each patient was recorded and a thorough clinical examination was performed.

Venous blood was collected in all women with aseptic precautions in EDTA anticoagulant for hematological investigations. Separate blood sample was collected for biochemical investigations. Serum was separated on the same day of blood collection and stored in refrigerator between 2 to 8 degree centigrade. Biochemical study was carried out within three days of blood collection. The hematological investigations were performed on Sysmex KX-21 (Transasia Ltd) with standard calibration using fresh whole blood. As a part of CBC, red blood cell indices (MCV, MCH, MCHC), PCV, RDW, white blood cell count and platelet count were obtained by Sysmex KX-21. Serum ferritin estimation done by biochemical method.

Peripheral blood smear study was performed on each of these patients. A good peripheral smear was made and the blood film was stained by Leishman's stain. Staining characteristics and morphological abnormalities of red blood cells were observed. Their distribution, anisocytosis, poikilocytes, elliptical cells, pessary cells, tear drop cells, white blood cell morphology and platelet morphology were observed.

All inpatients and outpatients women in the reproductive age group (20 to 40years) having a haemoglobin less than 11 gm/dl were included in the study. Patients having history of taking supplemental iron during previous year, history of blood transfusion, family history of anaemia, history of receiving oral contraceptive pills (OCP) were excluded from the study.

Table 1 : Age Distribution of Patient Studied

Age in year	No. of Patients	%
20-25	40	40
26-30	20	20
31-35	13	13
36-40	27	27
Total	100	100.0

Table 2 : Number and Percentage of Women With Mild, Moderate and Severe Anemia

Anemia	No. of Patients	%
Mild	40	40
Moderate	43	43
Severe	17	17
Total	100	100.0

Table 3 : Age Distribution in Mild, Moderate and Severe Anemia (N=100)

Age in year	Mild anemia	Moderate anemia	Severe anemia	Total
20-25	15	20	8	43
26-30	8	8	4	20
31-35	5	5	2	12
36-40	12	10	3	25
P value >0.05				

Table 4: Relation of Peripheral Smear with Severity of Anemia

Peripheral smear	Dimorphic	Normocytic hypochromic	Microcytic hypochromic
Mild anemia	9	18	13
Moderate anemia	0	1	42
Severe anemia	0	2	17
Total	9	19	72

Table 5: Serum Ferritin

Serum ferritin Normal range:20-110 µg/L	Range(µg/L)	Mean
Normal N=2	20-110	62.75
Mild ↓ N=11	12.1-18	16.88
Moderate ↓ N=42	6.1-12	10.80
Severe ↓ N=17	<6-6	4.87

Table 6: Type of Anemia in Reproductive Age Group N=98

Type of anemia	No. of patients	Percentage (%)
Dimorphic anemia	9	9.2
Normocytic hypochromic anemia	19	19.4
Iron deficiency anemia	70	71.4
Total	98	100

Table 7: Association of Grade of Anemia With Type of Anemia

Grade of Anemia	Dimorphic Anemia	Normocytic Hypochromic Anemia	Iron Deficiency Anemia
Severe	0(0%)	0(0%)	17(24.3%)
Moderate	0(0%)	1(5.2%)	42(60%)
Mild	09(100%)	18(94.8%)	11(15.7%)
Total	9(100%)	19(100%)	70(100%)
Inference- Grade of anemia is significantly associated with Iron deficiency anemia with P<0.001			

RESULTS AND DISCUSSION

Detailed results of the study are enumerated in the tables from 1 to 9. Largest group of patients (40%) were in the age group of 20-25 years (Table 1), Maximum (43%) were having moderate anaemia (Table 2). Age distribution of various types of anaemia are shown in table 3. Majority of patients (72%) were suffering from microcytic

hypochromic type of anaemia (Table 4). Maximum nos. of patients (42%) have mean serum value of 10.80 µg/L, much below the normal value of 62.75µg/L (Table 5). Analysis of various types of anaemias in study group revealed, that 71.2% of women were having iron deficiency anaemia (Table 6).

Table 8 : Severity of Iron Deficiency Anemia in Moderate to Severe Anemic Patients

Anemia	Microcytic hypochromic	Di-morphic	Normocytic hypochromic	Iron deficiency
Mild N=40	13	9	18	11
Mod N=43	42	0	1	42
Severe N=17	17	0	0	17
Total	72	9	19	70
Inference- Grade of anemia is significantly associated with Iron deficiency anemia with P <0.001				

Table 9: Age Distribution of Anemic Cases in Comparison with Other Studies

Authors	20- 25 yrs	26- 30 yrs	31- 35 yrs	36- 40 yrs
Pai PM , 1975	48%	14%	13%	25%
Haniff J, 2007	53.6%	37.9%	4.2%	4.3%
Ahmad N, 2011	30.9%	20.9%	2.36%	45.84%
Present Study	40%	20%	13%	27%

Table 10: Distribution of Type of Anemia in Comparison With Other Studies.

Authors	Iron Deficiency	Dimorphic	Normocytic Hypochromic
Ratnam R, 2001	84%	9%	6%
Present Day	71.4%	9.2%	19.4%

Further analysis of association between grades of anemia with types of anaemia showed that 70 % of women classified as mild, moderate and severe anaemia were suffering from iron deficiency anaemia, difference between various group was significant statistically (Table 7).

As discussed earlier, Anemia is one of the most common medical conditions met during pregnancy. This was noted in most of the women attending the antenatal clinic. In the present study, Iron deficiency anemia accounted for 71.4%, dimorphic anemia for 9.2% and normocytic hypochromic anemia accounts for 19.4% in table.

In the present study, maximum number of cases was observed between 21-30 years accounting for 60% which correlated closely to observations made by other workers (Table 9).

In the present study, keeping haemoglobin standard as 11gm% maximum number of cases were classified as moderate anemia (43%) and minimum number of cases as classified as severe anemia(17%). According to Ratnam, (2001) keeping standard as 11gm% maximum number of cases as classified as moderate anemia (35.8%)

and minimum number of cases as classified as severe anemia (3.3%) which was similar to our study. According to Ahmad et al., (2011) keeping standard as 10gm%, maximum number of cases as classified as moderate anemia(50.9%) and minimum number of cases classified as severe anemia(18.9%).

The present study shows maximum number of cases was classified as Iron deficiency anemia (71.4%) and minimum number of cases was classified as dimorphic anemia (9.2%). According to Ratnam R. (2001) maximum number of cases classified as Iron deficiency anemia (84%) and minimum number of cases classified as Normocytic hypochromic anemia (6%).

Inference

Present study undertaken among females of reproductive age group to detect prevalence of anaemia brings out the fact, that iron deficiency anaemia among this group is still prevalent and dietary intakes needs to be further augmented to address the problem. Health education, improved dietary intake, supplementation at adolescent age, particularly among female would help in addressing the important preventable disorder, which has a bearing on mother and child health.

ACKNOWLEDGEMENT

Authors are thankful to management of Major S.D.Singh Medical College, Farrukhabad for granting permission to undertake the study. We also convey our sincere appreciation to laboratory staff for helping in carrying out tests and patients for their participation and co-operation.

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