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IRON DEFICIENCY ANEMIA IN CHILDREN "EXPERIENCE OF SINGLE CENTER"

Paediatrics

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ABSTRACT

Background: iron deficiency anemia is the most common type of anemia that occurs if the body doesn't have enough mineral iron.
Objectives: the study aims to determine the frequency of iron deficiency anemia in children of Wassit state and their response to management
Methods: Retrospective analysis of 80 patients having iron deficiency anemia registered in hematology centre in Al_Karama teaching hospital, Al-kut city, Iraq and evaluate the benefits of management, Demographic data of patient, age, sex, address, family history, and investigations before and after management.
Result: Eighty patients presented with iron deficiency anemia in Hematology center in AL_-Karama hospital. boys 50(62.5%), girls 30 (37.5%). Mean Age 51.7months, the patients with family history positive (ve+) 8 (10%), while negative in 72 (90%), 78(97.5) complaining from pallor while 2(2.5%) complaining from pica, the mean Hb level at first visit 7.75g/dl, and 11g/dl after treatment, while MCV mean was 59 fL, and 68.5 fL after treatment.
Conclusion: Anemia and Iron Deficiency must always be taken into consideration as they have a definite impact on the patient's quality of life. for that reason, they need adequate treatment so they can be the consequence of significant or severe diseases, so it is essential to investigate their origin.

KEYWORDS

Anemia, child, iron deficiency

Introduction

Iron deficiency is a worldwide most common nutritional deficiency, especially in developing countries making an important public health problem. [1] In developing countries iron deficiency is present in most of the pre-school children and pregnant women. According to the 2001 (WHO) data, in developing countries, 30% of children aged 0-4 years and 48% children aged between 5 -14 years are anemic. [2] The most important causes of iron deficiency in children include insufficient intake together with rapid growth, gastrointestinal losses due to cow's milk excessive intake, and low birth weight. [3] Many studies have shown that cognitive, motor retardation and mood disorders may be seen in children with iron deficiency.[4,5,6] The American Academy of Pediatrics and the World Health Organization have proposed many recommendations for iron deficiency prevention including giving iron-rich formulas when breastmilk is not enough, avoiding cow's milk in the first year of life, giving infants iron prophylaxis, and screening infants in the 9–12th months [7] The main principles in treatment of iron deficiency anemia include the diagnosis, searching for the causes of iron deficiency, replacement of deficiency, improvement of nutrition, and families education.[2]

Patients & methods:

We retrospectively analyzed the medical records of 80 patient having iron deficiency anemia registered in hematology center in Al Karama teaching hospital - Al Kut city ; Wasit state; Iraq. The data collected from April 2015 to April 2017. Diagnosis of iron deficiency anemia was based on history, clinical finding as well as RBCs indices. Due to lack facilities, the biochemical investigation as serum iron and serum ferritin were not available. Data was collected included age, sex, address, chief compliant, family history and investigations before and after management which includes: Hb, MCV, MCH, RDW and RBC count.

The patients were treated with oral iron therapy at dose of 6 mg elemental iron per kilogram of body weight per day for 3 months, two of the patients were treated with parenteral iron therapy due to poor compliance. Fifteen patients were excluded from the study, when they did not response to treatment and diagnosed of thalassemia minor was made by hemoglobin electrophoresis.

Descriptive statistics were performed using SPSS statistical software. The comparative study of the demographic variables was performed. Data are presented as mean ±SD and range for quantitative variables. Categorical data were expressed as numbers and percentage. Paired t test was used to assay P value for pre-and post-treatment values.

Result:

Eighty patients presented with iron deficiency anemia in Hematology center of AL Karama hospital. boys 50(62.5%), girls 30 (37.5%). Mean Age 51.7 months.

The patients who had the same condition in the family about 8 (10%) . while those who didn't have about 72 (90%). Pallor found in 78(97.5%), while 2(2.5%) complaining from pica. Ninety percent of the patients with no family history of anemia.

About sixty percent of the patients was from urban area while about forty percent of the patients were from rural areas.

At time of diagnosis, the mean of Hemoglobin level was 7.7 g/dl, while the mean of hemoglobin level post treatment period is 10.9 g/dl with P value 0.001.

The minimal range of hemoglobin level in pretreatment period was 4.3 g/dl, in spite of level of hemoglobin the blood transfusion was not option. The reason behind that is to avoid complication of blood and blood product such as hepatitis B and C especially in the circumstances where screening test for these infection is not reliable.

MCV mean level was 59 fl in pretreatment period, while this value increased during treatment period to 68.5 fl.

The mean level of MCH at diagnosis was 19.6 fl, and at end of treatment period, the mean level was 21.3 fl.

The decrement in RDW values in post treatment as compare to pretreatment was clear with significant p value, 0.02. while there was increment in RBC count in post treatment if compare with value in pretreatment period with significant P value, 0.001.

Table 1: Demographic Data of the patients

Item	Frequency	Percent
Sex data		
male	50	**62.5**
female	30	**37.5**
Chief complain		
pallor	78	**97.5**
Pica	2	**2.5**

Family history		
Family history of anemia	8	10.0
No family history of anemia	72	90.0
Address Data		
Urban area	49	61.2
Rural area	31	38.8
Total	80	100.0

Table2: hematological finding and iron profile among IDA patient

Item	Mean	Std. Deviation	Minimum	Maximum	P value
Age/ months	51.7	4.9	8	96	
Hb (g/dl) pre treatment	7.7	2.0	4.3	9.8	0.001
Hb (g/dl)Post treatment	10.9	1.8	7.0	14.2	
MCV fl/l pre treatment	59.04	7.633	44	74	0.01
MCV fl/l Post treatment	68.53	8.306	53	87	
MCH pre treatment	19.640	10.260	7.00	24.00	0.001
MCH Post treatment	21.390	4.8725	11.00	30.00	
RDW fl/l pre treatment	21.6	10.8	10.50	17	0.02
RDW fl/l Post treatment	18.6	6.0	8	10	
RBC pre treatment	3.861	65.25	2.18	4.600	0.001
RBC Post treatment	5.22	74.38	3.50	7.17	

Figure No. (1): blood parameter before and after treatment
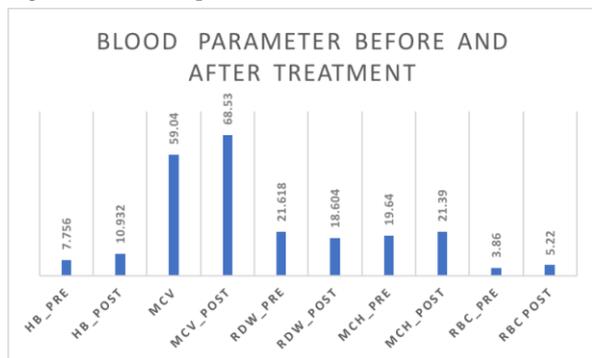
HB(Hemoglobin)
RDW(Red cell distribution width)
MCV(Mean corpuscular volume)
MCH(Mean corpuscular Hemoglobin)
RBC(Red blood cell)

Discussion:

Iron deficiency is the most frequent nutritional disorder in the world in spite of the efforts to reduce its frequency. In many areas of the world, The prevalence varies, with higher rates in the developing countries. [8,9] The incidence of anemia in developing countries is much higher than developed countries, so the study was aimed to clarify the frequency of anemia in Wassit Governorate. According to the WHO data, anemia is most common in west Africa and south Asia, with prevalence more common in children of 1-5 years of age [10]

The high prevalence of iron deficiency among our study population is from urban area while in Egypt study more in rural area. [11] this might be explained by the consumption of unfortified cow's milk feeding during the first year of life, low intake of iron-rich foods, unmet increased needs for iron due to intestinal parasitic infestation, rapid growth, or frequent consumption of tea with meals. Furthermore, actual statistics on the demography of Hematologic disease in the Iraqi population are largely unavailable.

Sometimes especially in developing countries, or in not capital area as Wasit state, Iraq, many laboratory facilities may be not available. As in our condition where the biochemical investigation such as serum iron and serum ferritin not accessed easily.

These circumstances force the doctor to rely on what is available.

The Hematological finding among IDA Patient showing Hypochromic microcytic, on first visit mean Hb level was 7.7 g/dl and mean of MCV was 59 fl then improved after treatment mean Hb became 11 g/dl and mean MCV 69 fl respectively.

When laboratory facilities not easily approached, response to treatment become the main diagnostic steps. Depending on that, another diagnosis rather than IDA was considered in fifteen patients who did not get response to treatment.

Conclusions:

Anemia and Iron Deficiency must always be taken into consideration as they have a clear impact on the patient's quality of life, and for that reason, they require adequate treatment and they can be the consequence of significant or severe diseases, so it is essential to investigate their origin. Hemoglobin and other indices such as (MCV, MCH, RDW, and platelets) were chosen in this study to diagnose Iron Deficiency Anemia, to be used for IDA screening.

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