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Research Paper

To Study Hematological Abnormalities of Platelet Count in Children With Iron Deficiency Anemia In India.

Medical Science

KEYWORDS :

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ABSTRACT

AIMS:

1.To evaluate and study the different abnormalities of platelet count in children with iron deficiency anemia.

INTRODUCTION

Iron deficiency anemia in first few years of life can have long term effects as it not only makes the children prone to several medical complications and infections, but also shows mental and behavioral development which can result in lower IQ level than general population as reported in the various studies held worldwide . Therefore, it is essential to study this prevalent disease in terms of effects, detection, treatment, prognosis . Therefore, these studies do not reflect the proportion of cases of thrombocytosis due to underlying iron deficient state in developing countries where iron deficiency anemia is more prevalent.

Materials and methods:

Patients attending Outpatient and In-patient Department of Pediatrics in the Rohilkhand medical College and Hospital, Bareilly. It was a hospital based prospective study conducted over a period of Dec 2013-May 2014. 200 patients under 18 years of age suspected of having iron deficiency anemia on the basis of microcytic anemia on initial hematological investigation. were enrolled.

OBSERVATIONS AND RESULTS

Most cases had anemia of moderate severity (65%), while a significant number of patients had severe anemia (27.5%).Among total of 200 patients, 49 i.e 24.5% were found to have thrombocytosis.Among total 49 cases with thrombocytosis, platelet count returned to normal after one month of iron therapy in 45 while rest all 4 cases had mild degree of thrombocytosis. Out of 200 patients of IDA, 12 patients were given anti-thrombotic prophylaxis in the form of low dose aspirin. This group included all the patients of moderate to severe thrombocytosis.

CONCLUSIONS:

IDA was found to be associated with pica, irritability, decreased appetite, poor weight gain, febrile seizure, neurological dysfunction and breath holding spells. Among the patients of iron deficiency anemia, a significant number had thrombocytosis. Anaemia is curable if diagnosed early, otherwise it may be fatal. Anaemic babies are retrospective marker of the nutritional status of women of the country. Improving mother's health and reducing child malnutrition are major challenges to human development in this millennium. Well nourished and healthy children will be healthier in their adolescence and more productive ages and also will give birth to healthier babies tomorrow contributing to human development in the present and future generation.

INTRODUCTION

In a developing country like India nutritional anemia constitutes a major disease burden. Anemia occurs when you have a level of red blood cells (RBCs) in your blood that is lower than normal. Iron deficiency anemia is the most common type of anemia, and it occurs when body doesn't have enough of the mineral iron.

The symptoms of moderate to severe iron deficiency anemia include:

general fatigue, weakness, pale skin, shortness of breath, dizziness, strange cravings to eat items that aren't food, such as dirt, ice, or clay, a tingling or crawling feeling in the legs, tongue, swelling or soreness, cold hands and feet, fast or irregular heartbeat, brittle nails, headaches.

Iron deficiency anemia in first few years of life can have long term effects as it not only makes the children prone to several medical complications and infections, but also shows mental and behavioral development which can result in lower IQ level than general population as reported in the various studies held worldwide . Therefore, it is essential to study this prevalent disease in terms of effects, detection, treatment, prognosis .

However the abnormalities in platelet counts have been described in several studies in iron deficiency anemia. Thrombocytosis has been observed in iron deficiency anemia (IDA) where no other explanation has been found for increased platelet count. Most of the studies are from developed countries, where nutritional anemia are less prevalent. Therefore, these studies do not reflect the proportion of cases of thrombocytosis due to underlying iron deficient state in developing countries where iron deficiency anemia is more prevalent. The prevalence of reactive thrombocytosis in IDA is also not known. Even slight fall the in platelet count has also been observed mostly in severe degree of IDA. Although it was believed that reactive thrombocytosis or thrombocytopenia as is seen in IDA do not lead to any thrombotic or hemorrhagic condition, now there are several case reports of IDA with increase platelet count which has let to thrombus formation and even proved to be fatal. It has also emerged as a major cause of stroke in children. These indicate that reactive thrombocytosis is not a benign condition as it was earlier thought. Therefore, it is essential to detect platelet anomalies associated with IDA, in order to monitor these cases closely and to start prophylaxis which needed so that devastating complications can be avoided.

AIMS AND OBJECTIVES

1. To evaluate and study the different abnormalities of platelet count in children with iron deficiency anemia.

2. To evaluate and study the changes in platelet count with treatment over a given period of time.

MATERIAL AND METHODS

The present study entitled **" To Study Hematological Abnormalities of Platelet Count in Children with Iron Deficiency Anemia in India "** was conducted on patients attending Outpatient and In-patient Department of Pediatrics in the Rohilkhand medical College and Hospital, Bareilly. It was a hospital based prospective study conducted over a period of Dec 2013-May 2014. The ethical committee clearance was taken. 200 hundred patients were enrolled after applying the following inclusion criteria and obtaining informed parental consent.

INCLUSION CRITERIA

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The study group comprised of patients of both sexes under 18 years of age suspected of having iron deficiency anemia on the basis of microcytic anemia on initial hematological investigation. The diagnosis of iron deficiency was confirmed by low serum ferritin and/or lower serum iron and TIBC levels.

EXCLUSION CRITERIA
Following children were excluded:

1.Children who have received blood transfusion and/ or hematinics before attending this hospital.

2.Children requiring blood transfusion after admission.

3.Seriously sick children.

All patients were evaluated clinically and were subjected to following investigations-

Serum Ferritin
Serum ferritin estimation was done by Microplate Immunoenzymometric Assay using BIOMEDA USA Kit.

Serum Iron
Serum iron were measured by Ferrozine calorimetric assay using Labkit (Ref 30270), Chemelex S.A. Barcelona.

Total Iron Binding Capacity TIBC
TIBC was measured using Saturation -Precipitation method using LABKIT (Ref 30340),

Chemelex, S.A. Barcelona.

DIAGNOSIS AND GRADING OF IRON DEFICIENCY ANEMIA
Definition of anemia according to **W.H.O**[2]

6 month - 6 yrs - Hb < 11gm/dl

6yr - 12yrs < Hb < 12 gm/dl

>12yrs - Boys < 13 gm/dl

Girls <12 gm/dl

Anemia was graded as mild, moderate and severe based on Hb concentration (gm/dl) as described-

Age	Severe anemia	Moderate anemia	Mild anemia	No anemia
6 mths- 6 yrs	≤ 7	7-9.9	10-10.9	≥ 11
(6-14) yrs	≤ 7	7-9.9	10-11.9	≥ 12
>14yrs (M)	≤ 7	7-9.9	10-12.9	≥ 13
>l4yrs (F)	≤ 7	7-9.9	10-11.9	≥ 12

For defining Microcytosis following formula was used

Age < 2yrs - MCV < 70fl

(2-10)yrs - MCV < 70 + age(years)

>10 yrs - MCV < 80 fl

Iron deficiency anemia was defined by-

- Microcytic hypochromic picture on peripheral smear with S.ferritin < 12ng/ml.
- Microcytic hypochromic picture on peripheral smear with S.ferritin > 12ng/ml with serum iron < 51 pg/dl and TIBC > 390 pg/dl. (Cut-offs were taken to represent iron deficient state based on controls established in laboratory).

FOLLOW UP
All the patients were followed up after one month of oral iron supplementation. A repeat complete hemogram was done to document rise in hemoglobin level, RBC, MCV and also change in platelet count with correction of anemia.

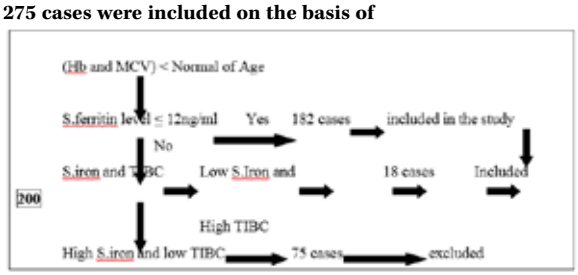
Statistical analysis

- All results were analysed using Windows SPSS software version 12.
- For comparisons of means between different groups and means of two sets of readings within the same group, unpaired and paired Student's t-test respectively was used.
- For comparisons of proportions Chi-square test was used.
- For correlation studies Carl-Pearson correlation coefficient (r) was used.

OBSERVATIONS AND RESULTS
The study entitled **"To Study Hematological Abnormalities of Platelet Count in Children with Iron Deficiency Anemia in India ."** was conducted in the Department of Pediatrics, Department of Pathology and Biochemistry Rohilkhand medical College and Hospital,Bareilly.

The following are the Observations and results in an outline form.

275 cases were included on the basis of



A total of 275 cases were initially included on the basis of microcytic anemia with Hb and MCV below normal of age. In order to confirm the diagnosis of IDA, S. ferritin level was done and in 182 cases with value < 12ng/ml were taken as confirmed cases of IDA.

Those with ferritin level >12ng/ml were further subjected to S.Iron and TIBC tests. 18 cases with Low S.iron along with high TIBC were included in the study as confirmed cases of IDA.

Thus a total of 200 cases upto the age of 18 years were included in the study over a period of one year.

Table 1. Age and sex distribution of cases

Age Group	Male (%)	Female (%)	Total (%)
0 – 1 year	21 (55.3%)	17 (44.7%)	38 (19%)
1 – 2 years	43 (69.35%)	19 (30.65%)	62 (31%)
2 – 5 years	44 (62.85%)	26 (37.15%)	70 (35%)
5 – 10 years	7 (43.75%)	9 (56.25%)	16 (8%)
> 10 years	6 (33.3%)	8 (66.7%)	17 (7%)
Total	121 (60.5%)	79 (39.5%)	200 (100%)

The table shows age and sex distribution of the cases of iron deficiency anemia. Among them, 60.5% of cases are made and 39.5% cases are female. Most com-

mon group compromises of children between 2 to 5 years age account for 35%. Children of 1 to 2 years accounts for 31% while infants under one year were 19%. Thus children less than 5 years of age accounts for 85% cases while those more than 5 years contributed only 15%. Upto 5 years of age, males constitute the majority while after 5 years females are found to have the major burden of iron deficiency anemia. **(Fig.1)**.

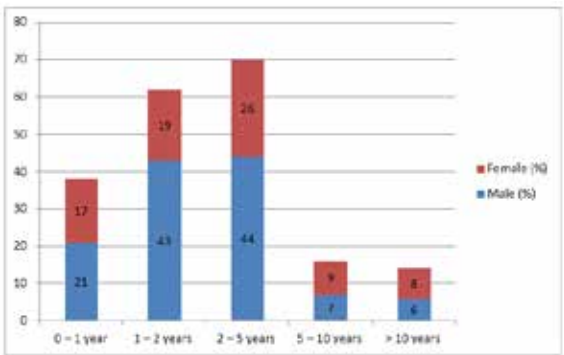


Figure 1. Age and sex distribution of Patients

Table 2. Distribution of cases of IDA according to the severity

Severity of Anemia	Male (%)	Female (%)	Total (%)
Mild	6 (60%)	4 (40%)	10 (5%)
Moderate	87 (64.5%)	48 (35.5%)	135 (67.5%)
Severe	32 (58.2%)	23 (41.8%)	55 (27.5%)
Total	125 (62.5%	75 (37.5%)	200 (100%)

All the patients of iron deficiency anemia were further analyzed according to their severity (Table 2). Most cases had anemia of moderate (Hb 7 – 9.9gm%) severity (65%), while a significant number of patients had severe (<7 gm%) anemia (27.5%).

Table 3. Initial Hematological indices of all patients

	N	**Mean ± SD**
Hb (gm%)	200	7.74 ± 1.21
TLB (/mm^3)	200	7919.50 ± 2593.61
MCV (fl)	200	65.90 ± 4.48
Platelet count (x10^{9}L)	200	3.76 ± 1.68

The table shows descriptive analysis of the initial haematological parameters of 200 enrolled patients. The mean HB value is in the range of moderate degree of IDA according to the WHO criteria. The mean TLC and the average platelet count are within the normal range.

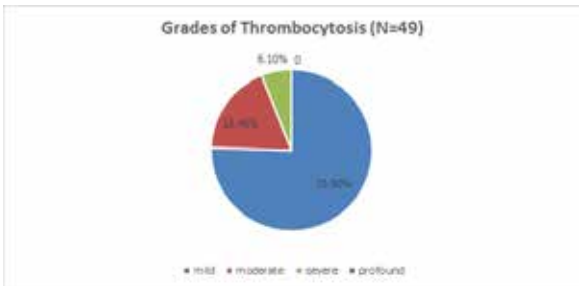
Table 4. Numerical abnormalities of Platelet counts in children with IDA (N=200)

Platelet Count	No. of Patients	Percentage (%)
Normal Platelet count (150-450) x 10^9 /L	151	75.5%
Thrombocytosis (>500x10^9/L)	49	24.5%
Thrombocytopenia (<150x 10^9/L)	0	0%

Among 200 cases of IDA, 151 had platelet count within the normal range while 49 cases (24.5%) had thrombocytosis and no case of thrombocypenia was documented.

Table 5. Grades of Thrombocytosis (N=49)

Grades of Thrombocytosis	No. of Patients	Percentage (%)
Mild (500-700) x 10^9/L	37	75.5%
Moderate (700-900) x 10^9/L	9	18.4%
Severe (900-999) x 10^9/L	3	6.1%
Profound (>1000) x 10^9/L	0	0%



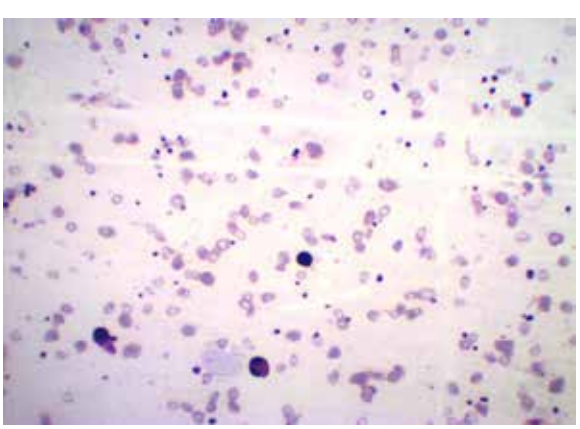
Among total of 200 patients, 49 of them i.e. 24.5% were found to have thrombocytosis.

Thrombocytosis found in these cases were further classified according to the grades of severity. Most of the case (75.5%) had mild thrombocytosis while moderate thrombocytosis was documented in 18.4%. Very few cases had thrombocytosis which was of severe grade (6.1%). Profound thrombocytosis was not found in any case. **(fig. 2).**

Table 6. Age-wise distribution of grades of thrombocytosis

Age Group	Mild Thrombocytosis	Moderate Thrombocytosis	Severe Thrombocytosis	Total
0 – 1 years	9	4	0	13 (26.5%)
1 – 2 years	10	3	0	13 (26.5%)
2 – 5 years	16	1	3	20 (40.8%)
5 – 10 years	2	1	0	3 (6.2%)
>10 years	0	0	0	0 (0%)
Total	37 (75.5%)	9 (18.4%)	3 (6.1%)	49 (100%)

The table shows age-wise distribution of cases with thrombocytosis. It shows that most of the cases of thrombocytosis (93.8%) are clustered in the age group below 5 years. No case of thrombocytosis was found in the age group more than 10 years. Among all groups, there are more cases of mild thrombocytosis while only 3 cases of severe thrombocytosis were found among total of 200 cases and all these cases with severe thrombocytosis were of the age group 2 – 5 years.



Picture : Thrombocytosis in IDA (40X)

Table.7 Distribution of the different grades of thrombocytosis according to the severity of Anemia

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Total Cases of Anemia	Total Thrombocytosis
Mild (10)	2 (20%)
Moderate (135)	37 (27.4%)
Severe (55)	10 (18.2%)
Grand Total (200)	49 (24.5%)

Among total cases of IDA, maximum prevalence of thrombocytosis was found in the group with moderate degree of IDA. In this group, thrombocytosis was found in 27.4% of cases, while 18.2% severe IDA had associated high platelet count.

Table.8 Distribution of cases with different severity of Thrombocytosis according to the severity of Anemia

Severity of Anemia	Mild Thrombocytotis	Moderate Thrombocytosis	Severe Thrombocytosis	Total
Mild Anemia (10)	1	1	0	2 (4.1%)
Moderate Anemia (135)	28	7	2	37 (75.5%)
Severe Anemia (55)	8	1	1	10 (20.4%)
Total (200)	37 (75.5%)	9 (18.4%)	3 (6.1%)	49 (100%)

The table shows distribution of cases of thrombocytosis with the severity of iron deficiency anemia. There was no case of thrombocytopenia. It was seen that most of the cases of thrombocytosis were found in children with moderate degree of anemia. Only 2 cases of thrombocytosis were documented in the mild degree of IDA. Among total of 49 cases of thrombocytosis, 37 (75.5%) were found in children of moderate iron deficiency anemia and 10 cases i.e. 20.4% were in the group of severe IDA.

Table 9. Correlation of plate let count with severity of iron deficiency

(Hb and Ferritin)

Platelet Count	Hemoglobin		S.Ferritin		MCV	
	r	p value	r	p value	r	p value
Initial	-0.157	0.042	-0.137	0.048	-0.100	0.197

The table shows correlation (Carl-Pearson test of correlation) of platelet count with Hb, S.ferritin and MCV values at initial presentation. It depicts negative correlation of platelet count with initial Hb value and initial ferritin level while association with MCV was not significant (>0.05).

Table 10. Hematological indices at one month of follow-up as compared with the indices at presentation.

Indices	n	**Initial presentation (mean±2SD)**	**After one month (mean±2SD)**	**Mean differences in values ± 2SD**	p value
Hb (gm%)	200	7.74±1.21	9.33 ± 1.26	1.59 ± 0.57	0.000
TLC (/mm^3)	200	7919.50 ± 2593.61	7624.5±1946.46	295.00±1407.12	0.003
MCV (fl)	200	65.90 ± 4.48	69.34 ± 4.02	3.44 ±2.24	0.000
Platelet Count (x10^{9}L)	200	3.76 ± 1.68	3.08 ± 0.89	0.68 ± 1.27	0.000

This table shows the comparison of haematological indices at initial presentation and at one month of follow up. The average Hb value after one month of treatment is in the mild degree of severity of IDA according to the WHO guidelines, while TLC and platelet count is in the normal range. The mean rise in Hb value is 1.58gm%. TLC shows average decline of 295/mm^3 with treatment. Mean rise in MCV is 3.44fl while platelet count show average decline of 67890/mm^3. All these changes with iron supplementation over month were statistically significant (p value < 0.05).

After one month of iron supplementation, repeat Hb count was done which shows normalization of Hb level in 25/200 (12.5%), however, all the patients were supplemented for at least 3-4 months of complete restoration of iron status.

Table 11. Platelet count at one month in cases with initial thrombocytosis

Total cases of Thrombocytosis	Platelet count normalized (%)	Platelet count not normalized (%)
49	45 (92%)	4 (8%)

Among 49 cases of thrombocytosis, 45 cases showed normalization of count after one month of iron supplementation and only 4 cases had persistent high court. All the 4 cases those had persistent thrombocytosis after month of treatment, had their platelet count in the mild range of severity.

Table 12. Treatment given to the patients of thrombocytosis

Intervention	**No. of Patients**
Aspirin prophylaxis	61.0 ± 35.84
Moderate (N=9)**	12
Anticoagulation therapy	0

Out of 200 patients of IDA 12 patients were given anti-thrombotic prophylaxis in the form of low dose aspirin. This group included all the patients of thrombocytosis of moderate or severe grade. No cases required anti-coagulation therapy.

DISCUSSION

As depicted in the Table 1 in the section "Observations and analysis", the most common group comprised of children between 2 to 5 years age accounting for 35%. Infants were 19%, while children of 1 to 2 years contributed 31%. Children less than 5 years of age accounted for 85% cases while those more than 5 years contributed only 15%. This probably reflects the observations of National Family Health Survey-III **(NFHS-3)[1]** conducted during 2005-06 the prevalence of anemia is 69.5% was found amongst the children aged 6 to 59 months. The prevalence was maximum amongst younger children (12-17 months - 84.5%, 18-23 months 81.6%). A study done in Yazd province of Iran by **Karimi et al[2]** also showed that iron deficiency and IDA were most frequent in younger age group and decreased as age increased. This result corresponds to the findings of other studies that suggest that IDA is due to delayed introduction of complementary feeds, predominantly milk based diet and an increase in iron intake from different foods as age increases. In our study upto 5 years of age, males constitute the majority while after 5 years females are found to have the major burden of iron deficiency anemia and the incidence were higher among boys than in girls, a result similar to the findings of many other studies like the work done by **Nicklas et al[3]** in Haiti. This might reflect in general more health care seeking behaviour for male compared to female child in our society.

As shown in **Table 2**, all the cases of iron deficiency anemia were further analysed according to their severity. It shows that most cases had anemia of moderate severity (65% significant number of patients had severe anemia (27.5%). Milder cases of iron deficiency anemia though assumed to be more prevalent, this being a hospital based study, reflects the more severely affected group. Hence, the major group in the study consists of moderate degree of IDA.

The mean value of major haematological parameters at the time of enrolment was calculated as shown in **Table 3**. As maximum cases of IDA were of moderate severity, the mean Hb value was also in the moderate grade, while TLC and platelet count were in the normal range. In these confirmed cases of IDA, platelet counts were analysed as depicted in **Table 4**, which shows that out of 200 patients, 49 had thrombocytosis (24.5%), 151 cases had normal platelet count and no case of thrombocytopenia was documented. **Duzgun et al[4]** studied 102 children with IDA compared with 21 age matched healthy controls and found that among them 40 i.e. 39.2% had thrombocytosis, an incidence similar to our observation. other pediatric study is available on the prevalence of thrombocytosis in IDA.

Association of thrombocytosis with IDA is well recognised. However, how much IDA contributes to thrombocytosis and how common is thrombocytosis in IDA is only scarcely reported. The reason behind this may be that, most of these studies are from Western world, where IDA is not that much prevalent. Therefore, their studies do not reflect the impact of IDA on the incidence of thrombocytosis. However, there are some studies where IDA was found to be a cause of reactive thrombocytosis and the observations are quite different among the studies from developed and developing countries. Iron deficiency anemia accounted for only 9% cases of thrombocytosis in both of the studies by **Vora et al[5]** and **Matsubara et al[6]**. The study from Japan by Matsubara estimated that 6.4% of cases of reactive thrombocytosis had IDA. On the contrary, a study from our hospital found IDA (alone or with infection) as the second most common cause (most common cause was infection) of reactive thrombocytosis where it was responsible for as many as 40% cases of reactive thrombocytosis in children.

The cases with thrombocytosis were further analysed according to their severity and was graded as mild, moderate, severe and profound **(Table 5)**. Most of the cases (75.5%) were in the group of mild thrombocytosis while moderate thrombocytosis was documented in 18.4%. Very few cases had thrombocytosis which was of severe grade (6.1%) and no case had profound degree of thrombocytosis. This is documented that reactive thrombocytosis found in IDA is mostly of mild to moderate degree, and there are only rare cases of severe or profound thrombocytosis in IDA. Platelet count rarely exceeds 700 x $10^3/\mu l$[41]. A study by **Mulakkan et al[7]** on reactive thrombocytosis also documented only 2% cases with thrombocytosis of severe grade. In a report by **Kasper et al[8]** on 100 patients of IDA, platelet counts were above $1000x10^9$ in 7% patients. In one series on thrombocytosis in IDA, by **Schloesser et al[9]** the average platelet count was $499x10^9/L$ or roughly twice the control. **Diagne et al[10]** reported 9 children with IDA having moderate to extreme thrombocytosis.

Table 6 depicts age-wise distribution of cases with thrombocytosis. It shows that most of the cases of thrombocytosis are clustered in the age group below 5 years and no case of thrombocytosis was found in the age group more than 10 years. Among all groups, there are more cases of mild thrombocytosis while only 3 cases of severe thrombocytosis were found among 49 cases and these cases with severe thrombocytosis were of the age group (2-5) years. This appears to be reflecting the fact that cases of IDA are reported to be high in this age group. **Matsubara et al 2004[6]** also reported maximum incidence of thrombocytosis at one month of age (35.8%) with gradual decline to 0.6% in more than 11 year age group. In our study as the children between age group 2-5 years were the major group and the prevalence IDA was also high in this group, may explain this finding.

Table 7 shows prevalence of thrombocytosis in each grade of IDA, which also clearly describes that among total cases of IDA, maximum prevalence of thrombocytosis was f0Un(1 in the group with moderate degree of IDA (27.4%) while 18.2% cases with severe IDA had associated high platelet count.

Table 8 shows distribution of different grades of thrombocytosis according to the varying severity of IDA. Among total of 49 cases of thrombocytosis, 37 (75.5%) were found in children of moderate iron deficiency anemia and 10 cases i.e 20.4% were in the group of severe IDA. No case of thrombocytopenia was found among 200 patients. Thrombocytosis is found in different pathological conditions. It can occur as a reactive mechanism or as a result of autonomous overproduction. In a report of 90 consecutive patients with elevated platelet counts, 70% had reactive thrombocytosis. Thrombocytosis seen in iron deficiency anemia in the literature is described as an example of reactive thrombocytosis, but the mechanism is not clear yet.

Though studies have documented thrombocytopenia in IDA, most cases with low platelet count were in children with very severe IDA. A case report by **Gupta et al[11]** also found that very severe degree of IDA in an adult women (Hb level of the case-1.6gm%) was associated with thrombocytopenia. **Perlman et al[12]** studied six patients between the age group 14 months to 17 years (mean age 27 months) with severe anemia (mean Hb value of 2.5gm%) and thrombocytopenia (mean platelet count-$64x10^9/L$) and it was seen that megakaryocyte and platelet counts increased following iron therapy which again validated other studies showing association between IDA and thrombocytopenia and also suggest the role of iron in the late stages of thrombopoiesis. As our study had the criteria of excluding very sick patients anemia of severe grade requiring blood transfusion, we might have missed the cases of severe IDA with low platelet count.

Using experimental animal models, **Karpatkin et al[13]** described a dual role of iron in thrombopoiesis. The researchers phlebotomized guinea pigs and found that chronic blood loss resulted in a 1.4-fold increase in platelet count, whereas chronic blood loss and concomitant iron therapy resulted in a 2.5-fold increase in platelet count through a significant increase in megakaryocyte number. They also found that in animals that were acutely bled while on an iron- deficient diet, megakaryocyte count decreased, indicating that iron is required for platelet production. After the role of iron was demonstrated, **Kiem et al[14]** showed that iron is present in platelets in a concentration of approximately 12.28 μg/g, further supporting the hypothesis of Karpatkin and colleagues that iron may have a functional role in controlling platelet production and iron is required for platelet protein synthesis.

Level of Hemoglobin and MCV are usually taken into account to grade the severity of IDA. To assess the correlation between severity of thrombocytosis and severity of IDA, the correlation between Hb, MCV ferritin and platelet count was studied at initial presentation during enrollment and at one month follow-up with iron supplementation. It showed negative correlation with Hb, MCV and S.ferritin level initially (r -0.157, -0.100, -0.137) and where significant correlation was only with Hb (p value 0.042) and ferritin (p 0.048) but not with MCV (p 0.197) as shown in **Table no. 9**.

CONCLUSION

To conclude, Iron deficiency anemia is a very common cause of morbidity in children in a developing country like India especial-

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ly in the pre-school group. In the age group below 10 years, male predominance was clearly seen. Iron deficiency anemia mostly was of moderate grade. IDA was found to be associated with pica, irritability, decreased appetite, poor weight gain, febrile seizure, neurological dysfunction and breath holding spells. Among the patients of iron deficiency anemia, a significant number had thrombocytosis. No case of thrombocytopenia was observed.

Majority of the cases with elevated platelet counts had thrombocytosis of mild grade, while few cases of severe thrombocytosis were also found. Platelet count had significant negative Correlation with Hb and ferritin level at the initial presentation. Almost all the cases of reactive thrombocytosis found in IDA was rapidly brought to normal or near normal within one month of oral iron therapy consequent to the improvement in the iron deficiency status. Henceforth it is very essential to monitor the serum iron , ferritin , TIBC levels to prevent the complications from the Iron deficiency anemia. The mother and patient education is very important in this context as the effects of the disease in the community are preventable . Anaemia is curable if diagnosed early, otherwise it may be fatal. There are motivational problems among people because it is not a dramatic illness. Therefore, health workers should motivate the target population to introduce

more iron rich food in the daily diet. Anaemic babies are retrospective marker of the nutritional status of women of the country. Improving mother's health and reducing child malnutrition are major challenges to human development . Well nourished and healthy children will be healthier in their adolescence and more productive ages and also will give birth to ealthier babies tomorrow contributing to human development in the present and future generation.

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