Original article

Study of correlation between hemoglobin count and platelet count in pediatric age group in rural area

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Abstract:

Introduction: Thrombocytosis in children can occur due to various causes leading to serious thromboembolic complications. Thrombocytosis is a commonly encountered clinical scenario, with a large proportion of cases discovered incidentally. With this background the present Study was planned to correlate between hemoglobin count and platelet count in pediatric age group in rural area.

Methodology: Children with pallor detected among those attending out-patient department for common childhood illnesses and diagnosed to be due to iron deficiency were included in present study. Investigations were done .

Results : The correlation between Hemoglobin and Platelet count is negative, that is if Hemoglobin increases (decreases) platelet count decreases (increases) and the correlation is statistically significant ($p < 0.05$)

Conclusion: From present study it is clearly seen negative association between hemoglobin count and platelet count in pediatric age group.

Keywords: Hemoglobin count , Platelet count , Pediatrics

Introduction:

Thrombocytosis in children can occur due to various causes leading to serious thromboembolic complications. Thrombocytosis is a commonly encountered clinical scenario, with a large proportion of cases discovered incidentally. The differential diagnosis for thrombocytosis is broad and the diagnostic process can be challenging. Thrombocytosis can be spurious, attributed to a reactive process or due to clonal disorder. This distinction is important as it carries implications for evaluation, prognosis, and treatment. [1,2]From the non-infectious causes of secondary thrombo-cytosis, iron deficiency is a common one, since it is the single most common nutritional deficiency worldwide [3,4]. with this background the present Study was planned to correlate between hemoglobin count and platelet count in pediatric age group in rural area.

Material and method:

The study was conducted in dept. of Pediatrics of Pravara Rural Medical College over a period of two years after obtaining approval from the Institutional Ethics Committee. The subjects who satisfied the following inclusion and exclusion criteria were enrolled in the study after obtaining informed consents from parents or legal guardians.

Inclusion criteria:

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- Children with pallor detected among those attending out-patient department for common childhood illnesses and diagnosed to be due to iron deficiency.
- Children in the age group of 6 months to 12 years.

Exclusion criteria:

- Children with age less than 6 months or more than 12 years.
- Children with chronic illnesses of prolonged duration.
- Children with anemia due to causes other than iron deficiency.
- Children with thrombocytosis due to causes other than iron deficiency anemia.
- Parents/ Lawful guardians not willing to give informed consent for the partic-ipation of the subject.

Subjects were enrolled over a period of two years. Parents of 100 children who satisfied inclusion and exclusion criteria agreed to enroll their wards.

Methodology:

The selected patients were subjected to a detailed history and thorough clinical examination as per the proforma attached. Relevant investigations were done as per individual case requirement. Their consent was recorded in the Informed Consent Document. The skin surface was wiped with iodine and then with spirit. The spirit was allowed to air dry and then using a 23 gauge needle, 10 ml of venous blood was withdrawn and 2 ml was preserved in an EDTA bulb, 4 ml in a plain bulb, and the rest was centrifuged at a rate of 2500 rpm for 5 to 10 minutes so that clear supernatant was achieved. This serum was separated and stored at -20 degree Celsius and used for subsequent analysis for Serum Ferritin. The samples in the EDTA and the plain bulbs were transported manually at room temperature to the laboratory and processed for CBC and Serum Iron, Serum TIBC respectively as soon as possible. From EDTA blood, total and differential white cell counts were done by automated cell counter and counter checked by peripheral smear examination.

The data was collected and analyzed by using SPSS Version 11 software.

Observations and results:

Table No.1: Karl Pearson's Correlation coefficient between Hemoglobin and platelet count:

Karl Pearson's Correlation coefficient (r)	
Hemoglobin V/s Platelet count	r = -0.1517 significant , p<0.05

The correlation between Hemoglobin and Platelet count is negative, that is if Hemoglobin increases (decreases) platelet count decreases (increases) and the correlation is statistically significant (p<0.05)

Correlation between Hb and Platelet count

r = - 0.151
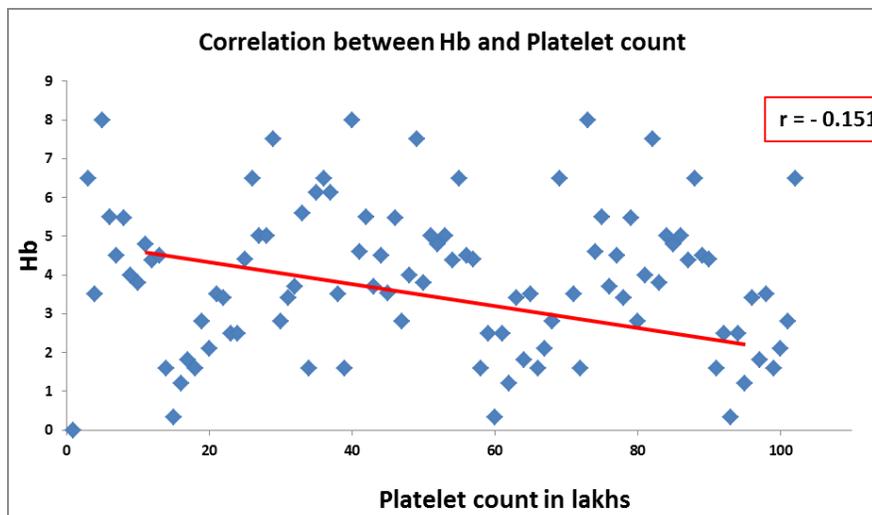
Discussion:

The present study has been conducted on cases coming to OPD for various medical problems. The aim of the study was not to evaluate the incidence/ prevalence of IDA but to find out the correlation between hemoglobin count and platelet count as part of our project.

Table 2: Distribution of IDA according to age in various studies.

	No. of Cases (n)	< 1 year	1-5 years	5-10 years	> 10 years
Present Study	100	30	52	12	6
Sharma et al	312	200			
Dalal et al	40	18	7	15	
Bhagoankar et al	50	24			

In the present study (2012), the cases of IDA are maximum in the age group of 1 to 5 years with 52 cases (52%) while in the age group of more than 10 years, only 6 cases (6%) are affected with iron deficiency anemia.

In the study of Duzgun et al that comprised 102 anemic children, mean Hb was 8.73 g/dl which was higher than 6.60 g/dl observed in the present study. Mean HCT observed in our study is 24.99% which is slightly lower than 27.53%, observed in the above mentioned study. Mean serum iron of

21.37 in our study is in concordance with Duzgun et al.[5] In the present study, all the 100 cases have reduced MCV with a mean of 55.98 fl; reduced MCH with a mean of 17.63 pg correlating with microcytic hypochromic picture on peripheral blood smear. Red cell distribution width (RDW) which is helpful in differentiating iron deficiency anemia from other causes of microcytic hypochromic anemia, is high in all the cases of our study with a mean value of 22.34%. Mean total leucocyte count in our study is , mean platelet

count is 3,91,999 and the mean reticulocyte count is 0.92.

Etiological factors leading to IDA like deficient iron intake in the diet, the type of feeding upto the time of weaning, time of weaning and other factors will determine the incidence of IDA. This is evident from our study where history of improper diet is present in all the 100 cases. Improper weaning is noted in 18 cases, i.e. 18% of the patients with improper diet had improper weaning practices during the period of weaning. Worm infestation is ruled out in all the cases by stool microscopic examination. Other causes of iron deficiency anemia like blood loss are also ruled out. Thus, in the present study, it is the nutritional inadequacy only that has led to iron deficiency anemia.

In the present study, out of a total of 100 cases with iron deficiency anemia, 45 cases (45%) have thrombocytosis which is consistent with the findings of study by Duzgun et al in which out of 102 cases of IDA, 40cases (39.2%) had thrombocytosis. In our study, only 6 cases (6%) have thrombocytopenia, while 49 cases (49%) have normal platelet counts in the range of 1.5 to 4 lacs/μl.

While majority of thrombocytosis cases i.e. 30 cases out of 45, have platelet counts in the range of 4 to 5.5 lacs/ μl; only 6 cases have platelet counts above 7 lacs/μl.

In the recent study, only one case out of 45 cases of thrombocytosis due to IDA had complication in the form of cerebrovascular accident. This child, a girl child of 2 years, was brought with complaints of left sided hemiparesis following a single episode of generalized convulsions lasting for 2 minutes. The child had hemoglobin of 5.8 g/dl with total leucocyte count of 12,400 with 65% polymorphs. Platelet count was 6.5 lacs/μl. Peripheral blood smear showed microcytic hypochromic anemia with a high RDW of 29.7%. Vitals of the child were normal with BP of 94/60 mm of Hg, pulse rate of 120/min and respiratory rate of 30/min. Contrast enhanced CT brain of the child was done which revealed acute infarct in right side with generalized cerebral edema. All the causes of microcytic hypochromic anemia leading to stroke were looked for. Serum iron was 19.1 μg/dl with serum ferritin of 8.5 μg/ml

Conclusion:

From present study it is clearly seen negative association between hemoglobin count and platelet count in pediatric age group.

References:

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Cite this article as:

Dr.C.Ashokkumar, Dr. Abhishek Singla, Dr. M.C.Tayade, Dr. Nigavekar , Dr.Nitin Idgampalli , Study of correlation between hemoglobin count and platelet count in pediatric age group in rural area, Applied Physiology and Anatomy Digest , June 2016 (1) 01, 26-30