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ANEMIA IN CHILDREN WITH PALMAR PALLOR AGED 02 MONTHS TO 05 YEARS

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Absract:
Objective: *To determine the frequency of anemia in children with palmar pallor aged 02 months to 05 years*
Patients and Methods: *This cross sectional descriptive study of six months (01-12-2012 to 31-05-2013) was conducted in the department of paediatrics at Liaquat University Hospital Hyderabad. All the children, from 02 months to 05 years, of either gender had palmar pallor on examination were recruited and evaluated for anemia by assessing the level of haemoglobin and categorized anemia as mild, moderate and severe. The data was analyzed in SPSS version 16.00, the frequency and percentage was calculated. The chi-square test was applied at 95% confidence interval and the p- value ≤0.05 was considered as statistically significant.*
Result*: During 06 month study period total 137 children with clinically palmar pallor aged 02 months to 05 years were evaluated for the anemia biochemically by assessing the level of haemoglobin level. The mean age ±SD of overall children was 2.95±6.86, while the mean age ± SD of male and female children was 3.21±4.62 and 2.63±3.72 respectively. The anemia was observed in 94(68.6%) in children with palmar pallor (p = 0.01), of which 70(89.7) were males and 24(40.7%) were females (p <0.01). Majority of children were between 01 – 03 years (p=0.04) while as far as severity is concerned, 27(28.7%) had mild anemia, 32(34%) had moderate anemia and 35(37%) had severe anemia (p=0.04).*
Conclusion: *The palmar pallor sign is a sensitive and valuable tool and specific sign of anemia when used by the IMCI-trained pediatrician*
Key Words: *Anemia, Palmar pallor and Haemoglobin,*

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INTRODUCTION:

The etiology of anemia varies from malnutrition to chronic inflammatory, metabolic and infectious disorders especially in developing countries [1-3]. The use of conjunctival (eyelid), palmar, nail bed, and tongue pallor to detect children with anaemia was evaluated among children seen at an outpatient and inpatient hospital settings [4,5]. The nail bed or palmar pallor had the highest sensitivity (62% and 60%) compared with conjunctival pallor (sensitivity 31%), to detect the children with anaemia in the outpatient setting [6,7]. Children with moderate anaemia are best identified by the presence of nail bed or palmar pallor (90%) compared with conjunctival pallor (81%)[7] and the existence of anemia in children with palmar pallor was reported by Stoltzfus RJ, et al was 65% [8]. The prevalence anemia in children with palmar pallor reported by Centers for Disease Control and Prevention (CDC) was 61% [9], whereas it was reported as 28.74% in the study by Cala Vecino J, et al[10]. In Pakistan, it has been estimated that 56% of under five children are anaemic [11]. National Nutrition survey of Pakistan reported 65% children (7-60 months) were detected as anaemic [12]. According to WHO global data base on anemia, the prevalence of anemia in preschool children in South East Asian countries is 65.5% [13]. In a study by Kalter HD, et al [14] the prevalence of anemia in children with some and severe pallor was 88% and 90% while the individual proportions for severe and mild to moderate anemia observed in some palmar pallor subjects was 2% and 79% whereas the proportion for severe, moderate and mild anemia in severe palmar pallor children was 2%, 17% and 62% [14].

The Integrated Management of Childhood Illness (IMCI) strategy developed by the World Health Organization recommends the use of palmer pallor as the initial screening tool [15]. The Integrated Management of Childhood Illness (IMCI) authority advised palmer pallor to be used as screening tool and upon such strategy the studies were performed in the Gambia [16], Kenya [17], and Malawi [18] and only the Kenyaian study concluded that palmer pallor is superior to conjunctival pallor as far clinical anemia is concerned [16]. The generic IMCI guidelines use the clinical assessment of palmar pallor as the sole means to screen for anaemia and to use palmar pallor for grading the severity of anaemia becomes the simplest tool in areas with limited medical and laboratory facilities. Therefore this study was concerned to evaluate the anemia in children with palmar pallor aged 02 months to 05 years. There was no any former local study was conducted on this topic, therefore the present study evaluated the severity of anemia in children with palmar pallor to confirm whether these IMCI guidelines were applicable in our local setup or not. This strategy would saved time and financial resources of patients in far flung areas where laboratory / biochemical facilities are inadequate.

PATIENTS AND METHODS:

This Cross sectional descriptive of six months (01-12-2012 to 31-05-2013) was conducted at Paediatric Department, Liaquat University of Medical & Health Sciences, Jamshoro / Hyderabad. The sample size was estimated by taken the prevalence of anemia in children with palmar pallor 65%65 with 08% margin of error, so total 137 palmar pallor children were recruited. Inclusion criteria were children with age 02 months to 05 years with palmar pallor while the exclusion criteria children with history of thalassemia, children already diagnosed as leukemia/lymphoma and diagnosed case of constitutional / acquired aplastic anemia. All the children presenting at peadiatric department of Liaquat University Hospital Hyderabad with fulfillment of the inclusion and exclusion criteria were enrolled and entered in the study. The informed consent was taken from next to kin while the palmar pallor was evaluated by physical examination i.e. the colour of skin of palm of child was compared with the colour of palm of examiner (the researcher) under the supervision of consultant pediatrician have clinical experience more than 05 years and the child was labeled as having palmar pallor according to the parameters mentioned in operational definition. After confirmation of palmar pallor, all the relevant children were further evaluated for anemia by taking venous blood sample with sterilize needle / syringe, transferred to complete blood picture bottle, label it and then sent to laboratory for analysis of haemoglobin level and after getting the report / result of haemoglobin level was labeled as anemia Hb<11g/dL and categorized it according to the parameters mentioned in the operational definition i.e. mild, moderate and severe as far as the severity was concerned. All the maneuvers were performed by the researcher and were under the medical ethics. The considerations for parameters are as under:

(1) PALLOR: a reduced amount of oxyhaemoglobin in skin or mucous membrane caused by anemia diagnosed clinically thru physical examination by categorizing it in following two groups. i.e.

(a): Severe palmar pallor (clinically):

The colour of skin of palm of child was compared with the colour of palm of examiner and child was labeled as having severe palmar pallor when colour of palm of child including creases of palm looks white.

(b): Some palmar pallor (clinically)
The colour of skin of the child's palm is pale.
The palmar pallor was labeled when there was presence of any one or both of above two parameters.
(2): ANEMIA (biochemically): less than the normal quantity of hemoglobin in the blood and it was labeled when haemoglobin level <11.0 g/dl in blood. It was evaluated by categorizing in following three groups, i.e.
(a): Mild anemia: when haemoglobin is 8-10.9g/dl

(b): Moderate anaemia: when haemoglobin is 5.0-7.9 g/dl

(c): Severe anaemia: when haemoglobin is < 5.0 g/dl
The data was analyzed in SPSS version 16.0, the frequency and percentage (%), mean ±SD was

calculated. The stratification was done duration and severity of pallor and also for age and gender while the chi square test was used to compute the variables and the significant level was ≤0.05.

RESULTS:
Total 137 children with clinically palmar pallor aged 02 months to 05 years were evaluated for the anemia biochemically by assessing the level of haemoglobin level during six months study period. The mean age ±SD of overall children was 2.95±6.86, while the mean age ± SD of male and female children was 3.21±4.62 and 2.63±3.72 respectively. The age of children in relation to palmar pallor, gender and anemia is shown in Table 1-3 while the frequency & severity of anemia in children with palmar pallor is shown in Table 4 and Table 5.

Table 01: Age In Relation To Gender

	Gender			
Age	**Male**	**Female**	**Total**	**P-value**
02 months ≤ 01 year	29(37.2%)	00(0%)	29(21.2%)	
01 year ≤ 02 years	26(33.3%)	12(20.3%)	38(27.7%)	
02 years ≤ 03 years	15(19.2%)	22(37.3%)	37(27.0%)	<0.01
03 years ≤ 04 years	00(0%)	19(32.2%)	19(13.9%)	
04 years – 05 years	08(10.3%)	06(10.2%)	14(10.2%)	
Total	78(100%)	59(100%)	137(100%)	

*Statistically significant

Table 02: Age Distribution of Children In Relation To Palmar Pallor & Anemia

	PALMAR PALLOR			
Age (yrs)	**Severe**	**Some**	**Total**	**P-value**
02 months ≤ 01	12(13.6%)	17(34.7%)	29(21.2%)	
01 year ≤ 02	24(27.3%)	14(28.6%)	38(27.7%)	
02 years ≤ 03	28(31.8%)	09(18.4%)	37(27.0%)	0.04*
03 years ≤ 04	14(15.9%)	05(10.2%)	19(13.9%)	
04 years – 05	10(11.4%)	04(8.2%)	14(10.2%)	
Total	88(100%)	49(100%)	137(100%)	

*Statistically significant

	ANEMIA			
Age	**Yes**	**No**	**Total**	**P-value**
02 months ≤ 01	29(30.9%)	00 (0%)	29(21.2%)	
01 year ≤ 02	35(37.2%)	03(7.0%)	38(27.7%)	
02 years ≤ 03	28(29.8%)	09(20.9%)	37(27%)	<0.01
03 years ≤ 04	02(2.1%)	17(39.5%)	19(13.9%)	
04 years – 05	00(0%)	14(32.6%)	14(10.2%)	
Total	94(100%)	43(100%)	137(100%)	

*Statistically significant

Table 03: Gender In Relation To Palmar Pallor & Anemia

	GENDER			
Pallor	**Male**	**Female**	**Total**	**P-value**
Severe	59(75.6%)	29(49.2%)	88(64.2%)	
Some	19(24.4%)	30(50.8%)	49(35.8%)	0.01*
Total	78(100%)	59(100%)	137(100%)	

*Statistically significant

	GENDER			
Anemia	**Male**	**Female**	**Total**	**P-value**
Yes	70(89.7%)	24(40.7%)	94(68.6%)	
No	08(10.3%)	35(59.3%)	43(31.4%)	<0.01*
Total	78(100%)	59(100%)	137(100%)	

*Statistically significant

Table 04: Frequency & Severity of Anemia of Anemia in Children with Palmar Pallor

	PALMAR PALLOR			
Anemia	**Severe**	**Some**	**Total**	**P-value**
Yes	66(75%)	28(57.1%)	94(68.6%)	
No	22(25%)	21(42.9%)	43(31.4%)	0.03*
Total	88(100%)	49(100%)	137(100%)	

*Statistically significant

	PALMAR PALLOR			
Anemia	**Some**	**Severe**	**Total**	**P-value**
Mild	14(21.2%)	13(46.4%)	27(28.7%)	
Moderate	24(36.4%)	08(28.6%)	32(34.0%)	0.04*
Severe	28(42.4%)	07(25%)	35(37.2%)	
Total	28(42.4%)1	28(100%)	94(100%)	

*Statistically significant

Table 5: Severity of Anemia In Relation To Gender Distribution

	GENDER			
Anemia	**Male**	**Female**	**Total**	**P-value**
Mild	21(30.0%)	06(25.0%)	27(28.7%)	
Moderate	29(41.4%)	03(12.5%)	32(34.0%)	<0.01
Severe	20(28.6%)	15(62.5%)	35(37.2%)	
Total	70(100%)	24(100%)	94(100%)	

*Statistically significant

DISCUSSION:

The present study observed the anemia by evaluating the haemoglobin level in children with palmar pallor and identified that of 137 children with palmar pallor 94(68.6%) children have low haemoglobin level. The findings are consistent with the study by Cala Vecino J et al [24] and Getaneh T et al [25]. Clinical pallor is associated with hemoglobin level and observed in former published studies as clinical assessment of anemia [19-27] and is consistent with current series.

The previous studies were able to use clinical signs to identify most cases of severe and moderate or mild anaemia, and were usually able to differentiate these levels of anaemia from each other and from no anaemia [24,25]. The studies [22,25], have used pallor grades to identify severe and moderate anaemia, while the present study used some and severe pallor to correlate the mild, moderate and severe anemia. This distinction is necessary if degrees of anaemia are to be detected and appropriately managed [28,29].

Kalter et al in 1997 [26] observed that the combined observation of palmar and conjunctival pallor was able to detect between 71% and 87% of all cases of moderate anemia, and 50% or more of all cases of mild anemia; roughly one-half of non-anemic children were incorrectly classified as being anemic. The authors also reported low to moderate levels of sensitivity and specificity concerning the diagnosis of mild or moderate anemia (Hb 5-10 g/dl) through palmar or conjunctival pallor. In the same year Zucker et al [22] found that 60% of cases of severe anemia in children (Hb<5 g/dl) could be detected through clinical signs alone, and that such an evaluation could be used for identifying children with moderate or severe anemia. Luby et al [23] in 1995 recognized the validity of this method for the detection of severe anemia (93% sensitivity) and were able to identify 66% of children with moderate anemia.

The mean age ±SD and mean haemoglobin ±SD of the present study is consistent with the study by Ramesh BS [30]. In current series as far as anemia is concerned the male children were predominant, the findings are similar to the study by Luby SP, et al [23]. In contrast, the study of Brazil observed that it is still early to recommend such technique since the children who attend day-care centers rarely present Hb levels as low as those found in African studies [31]. The results could thus end up by excluding a number of children who should have been referred to medical treatment. In addition, given the level of subjectivity of this technique, its implementation would require intense, multiple-stage training a burden to children, who would have do be examined repeatedly. One the other hand the study also stated that, it is a simple and easily applied technique (it does not require any investment beyond training, and may be done by any member of day-care staff, as long as he or she is trained), which could promote substantial savings once perfected [31,32].

In summary, the findings of present study confirmed that a careful evaluation of clinical signs can correctly classify young children with anaemia. Severe and some pallor alone, respectively, identified many children with severity of anaemia. Palmar pallor alone significantly had highest sensitivity to detect anemia for the IMCI-trained pediatrician.

CONCLUSION:

Anemia is frequent in children aged less than 5 years old while the palmar pallor sign is a sensitive and valuable tool and specific sign of anemia when used by the IMCI-trained pediatrician.

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