Original Research Paper

Community Medicine

SIGNIFICANCE OF CLINICAL ASSESMENT OF PALLOR TO DETECT ANAEMIA IN 5-10YEARS AGE GROUP AT TERTIARY CARE LEVEL

Dr. Ambrish Mishra	Associate Professor, Department of Community Medicine, SSMC Rewa ,MP.
Dr. Sandeep Singh	Associate Professor, Department of Community Medicine, SSMC Rewa ,MP.
Dr. Anvita Mishra*	PG Resident, Department of Community Medicine, SSMC Rewa, MP. *Corresponding Author

ABSTRACT **BACKGROUND:** Clinical pallor at various anatomical sites is potential method for detecting severe anaemia in public health. WHO has included evaluation of palmar pallor to detect severe anaemia for management of sick child. This study was done to find out sensitivity of pallor to detect anaemia in less lab support peripheral areas.
OBJECTIVES:
1. To assess the sensitivity of pallor in various anatomical sites to find out anaemia.
2. To find association between Hb% and appearance of pallor.
METHODS: Cross Sectional, Observational study conducted at Paediatric IPD of GMH, SSMC, Rewa (M.P.).
RESULTS: Among 201 cases; Male & female constituted 55.22% & 44.7% respectively. Mean Hb was 9.06 gm/dl. Pallor at conjunctiva was in 91.5% of cases, at tongue 62.7%, at nail bed 42.2% & at palm 18.4% of the cases. Conjunctiva pallor was most sensitive (100%) in detecting severe anaemia followed by tongue pallor with 95.12% sensitivity.

KEYWORDS : Pallor, Anaemia, Hb%

INTRODUCTION:

Anaemia is the most common haematological disease of the paediatric age group, it is affecting almost one third of the world population most of whom live in resource poor countries. [1] Highest prevalence of anaemia is seen in developing countries. It is widely prevalent in India and affects both sexes and all age groups.[2] Anaemia being a widespread public health problem, is associated with an increased risk of morbidity and mortality, especially in pregnant women and young children [3] Most health providers in resource poor settings rely on physical signs of pallor to diagnose anaemia.

However, in many primary care settings, hemoglobin or hematocrit cannot be determined on a routine basis, even in high-risk groups such as sick children or pregnant women. Clinical pallor in anatomical sites where capillary beds are visible through the skin or mucosa is one potential method for detecting severe anaemia in public health practice. Because of its very low cost and feasibility, the World Health Organization has included evaluation of palmar pallor to detect severe anaemia in its algorithm for management of the sick child [4].

Anaemia is defined as a reduction in the total circulating red cell mass below normal limits (<11.5gm/dl in age group 5- 11 years). Anaemia reduces the oxygen carrying capacity of blood, leading to tissue hypoxia. In practice, the measurement of red cell mass is not easy, and it is usually diagnosed based on a reduction in hematocrit (the ratio of packed cell to total blood volume) and the haemoglobin concentration [5].

Pallor comes from the Latin word *pallere*, which just means to "be pale." [6]

Although diagnosis of anaemia can easily be done by traditional Sahli's haemoglobinometer or more recently by electronic cell counters, yet physicians and healthcare workers try to detect anaemia by looking at conjunctival, tongue, palmer or nail bed pallor [7].

Often physicians use clinical assessment of pallor as a screening test, and order haemoglobin test if one or more sites suggest presence of pallor. The physical signs to diagnose anaemia include conjunctival, tongue, palmer and nail bed pallor. [7]This is especially true at gross root level in health sectors and crowded outpatients departments of public hospitals, where most doctors believe that accurate estimation of haemoglobin is either not worth the time and effort needed to obtain it or do not have access to facilities to measure haemoglobin.

This study was done to assess significance of pallor to grade anaemia in less lab support equipped peripheral areas.

MATERIALS AND METHODS

The study was an observational, cross sectional study and it was conducted after obtaining the approval from the Institute Ethical Committee. This study was conducted on children of 5 to 10 years age, who were admitted in Department of Pediatrics S.S. Medical College Rewa (M.P.) Duration of study was 6 months (August 2018 to January 2019).

Convenient sampling method was used for the purpose of data collection. We looked for diagnosed anaemic patients among all admitted patients. After applying inclusion exclusion criteria and after getting verbal consent from parents/guardians of patients, data was collected through a pretested, self designed, semi-structured questionnaire and validity of questionnaire was assessed using the opinion of faculty members of Department of Community Medicine, S.S. Medical College, Rewa. Information of socio-demographic & details regarding social class, family income, occupation, education of the parents, birth order and specific information on current health problem, MCV, MCHC, MCH, Hb%, RBC count & others parameter were collected.

In this way we could register 201 patients in our study in a period of 6 months. A total of 201 childrens of either sex were included. A complete blood count was measured as

Table 3: Association between clinical pallor on various sites and grading of anaemia in study subjects

Severity of Anaemia	Anatomical sites				Total	Chi square & p value χ^2=38.225, p value= <0.00001
	Conjunctival Pallor (n=184)	Tongue Pallor (n=126)	Nail bed Pallor (n=85)	Palmar Pallor (n=37)		
Mild anaemia (Hb= 11-11.4gm%) (37)	25 (67.5%)	6 (16.2%)	6 (16.2%)	4 (10.8%)	41	
Moderate anaemia (Hb=8-10.9 gm%) (123)	118 (95.9%)	81 (65.8%)	42 (34.1%)	9 (7.3%)	250	
Severe anaemia (Hb <8 gm%) (41)	41 (100%)	39 (95.1%)	37 (90.2%)	24 (58.5%)	141	
Total 201	184 (91.5%)	126 (62.6%)	85 (42.2%)	37 (18.4%)	432	

per standard criteria. Anemia was diagnosed as per the WHO cut off criteria of Hemoglobin (Hb) level. Hb <11.5g/dL in 5-11 year, It was further classified into mild if Hb-11.0-11.4g/dL, moderate if Hb-8.0-10.9/dL and severe if Hb < 8 g/dL. The data were checked and analyzed. In order to study the association between Anaemia and various demographic variables; Chi square test was applied whenever applicable and a p- value < 0.05 was considered significant for the study purpose.

RESULTS & DISCUSSION
In the study among 201 subjects, 111 (55.2%) were males and 90 (44.72%) were females. Mean age of participants was 7.38 years with Standard deviation of 1.77 years.

Table1: Age & Gender wise distribution of study subjects (N=201)

Age	Male (n=111)	Female (n=90)	Total	Percent
5	20 (18%)	15 (16.6%)	35	(17.41%)
6	21 (18.9%)	22 (24.4%)	43	(21.4%)
7	20 (18%)	16 (17.7%)	36	(17.9%)
8	13 (11.7%)	10 (11.1%)	23	(11.44%)
9	14 (12.6%)	10 (11.1%)	24	(11.94%)
10	23 (20.7%)	17 (18.8%)	40	(19.9%)
Total	111 (55.22%)	90 (44.7%)	201	100%

In concordance to our study in a study **N. Sinha, P.R. Deshmukh & B.S. Garg (2008)** [8] also found that out of 772 children, 54% were males and 46% were females. **Mohapatra et al (2014)** [9] found that out of 385 subjects, majority (62%) were males and rest (38%) were females in their study.

In present study, maximum study subjects (61.19%) were found to be moderately anaemic followed by severe (20.39%) and mild anaemia (18.4%) according to WHO classification.

In a similar study by **Sahu et al** [10] also found that majority of study subjects were moderately anaemic. In their study 59.4% subjects were moderate, 35.2% mild and 5.4% were severely anaemic

Among the 201 subjects, Conjunctival pallor was present in majority (91.5%) of the subjects; with the mean hb was 9.12gm/dl. Tongue pallor was present in 62.6% and the mean hb was 8.5 gm/dl. Nail bed pallor in 42.2% with the mean hb was 8.1 gm/dl and palmar pallor was present in 18% with the mean hb was 7.3 gm/dl of the subjects. Conjunctival pallor was the only sign which appeared in 67.5% of mild anaemic subjects and all (100%) of severely Anaemic Patients.

Table 2: Mean hemoglobin levels and various sites of clinical pallor

Hb Values (gm/dl)	Clinical pallor at various body sites				
	Conjunctival pallor (n=184)	Tongue pallor (n=126)	Nail bed Pallor (n=85)	Palmar Pallor (n=37)	Standard error of difference of mean = 0.34 P value = 0.0001 (non significant)
Mean	9.12	8.56	8.18	7.35	
SD	1.77	1.80	1.95	2.39	

Conjunctival pallor was present in 184 patients and mean hemoglobin was 9.12 gm/dl in them. Tongue pallor was seen in 126 patients and mean Hb was 8.5 gm/dl, for nail bed pallor (in 85 patients) mean Hb was 8.1gm/dl and for palmar pallor (in 37 patients) mean hemoglobin was 7.3gm/dl. This indicates the patients who had palmar pallor positive, fell into severe grade of anaemia (mean Hb <8gm/dl).

Conjunctival pallor was present in majority (91.5%) of the patients and next common was tongue pallor (62.6%). Conjunctival pallor is the only sign which appeared in 67.5% of mild anaemic subjects and all (100%) of severely Anaemic Patients. There is significant association (p value <0.05) between clinical pallor and severity of Anaemia.

CONCLUSION
By the present observation it can be concluded that the presence of clinical pallor in any of the body sites (conjunctival pallor, tongue pallor, nail bed pallor, palmar pallor) is a reliable indicator of anaemia. Out of which conjunctival pallor was the most sensitive in detecting the anaemia as the grading of anaemia increases from mild to severe.

Hence in rural settings where ASHA and ANM mostly rely on the clinical signs for detecting anaemia, must give 1st preference to conjunctival pallor and if long standing conjunctival pallor is present along with tongue pallor and nail bed pallor, then ASHA & ANM should immediately refer that child to the Community Health Center or District Hospital.

REFERENCES:
1. Kalantri A, Karambelkar M, Joshi R, Kalantri S, Jajoo U. Accuracy and reliability of pallor for detecting anaemia: a hospital-based diagnostic accuracy study. PLoS One. 2010 Jan 1;5(1):e8545
2. Latham MC. Human nutrition in the developing world. Food & Agriculture Org.; 1997.

3.   World Health Organization. The world health report 2002: reducing risks, promoting healthy life. World Health Organization; 2002.
4.   Shrimpton R, Victora CG, de Onis M, Lima RC, Blössner M, Clugston G. Worldwide timing of growth faltering: implications for nutritional interventions. Pediatrics. 2001 May 1; 107(5):e75-.
5.   Robbins & Cotran pathologic basis of disease; south asia edition; vol-1
6.   American Academy of Pediatrics. Anemia and Pallor. In: McInerny TK, Adam HM, Campbell DE, DeWitt TG, Foy JM, Kamat DM, eds. *American Academy of Pediatrics Textbook of Pediatric Care, 2nd Edition.* American Academy of Pediatrics; 2017;
7.   Sheth TN, Choudhry NK, Bowes M, Detsky AS. The relation of conjunctival pallor to the presence of anemia. Journal of general internal medicine. 1997 Feb 1;12(2):102-6.
8.   Sinha N, Deshmukh PR, Garg BS. Evaluation of WHO haemoglobin colour scale & palmar pallor for screening of anaemia among children (6-35 months) in rural Wardha, India. Indian Journal of Medical Research. 2008 Sep 1;128(3):278.
9.   IOSR Journal of Nursing and Health Science (IOSR-JNHS) e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 3, Issue 6 Ver. III (Nov.-Dec. 2014), PP 42-46
10. Sahu T, Sahani NC, Patnaik L. Childhood anemia-A study in tribal area of Mohana block in Orissa. Indian Journal of Community Medicine. 2007 Jan 1;32(1):43.