ARE Palmer Pallor and Mucus Membrane Pallor Indicator for Classification of Anemia

Plan of Research

by

Dr. Somaya Al Jowder
Consultant Family Physician
Head of Naim H.C. Council

Dr. Ali Moh'd Mustafa
Family Physician.
Diploma Of F.Medicine.

Naim Health Center

Kingdome Of Bahrain

2003 - 2004

Study tackles Issue of Anemia

In a clinical paper by Dr. Samaya Al Jowder (Consultant family Physician Head of Naim H.C.Council) and Dr. Ali Mohammed Mustafa (family Physician.Diploma of family Medicine).Kingdom of Bahrain studied (ARE Palmer Pallor and Mucus Membrane Pallor Indicator for Classification of anemia.

There are large number of anemia patient in crowded out clinic patient in Bahrain and the study determined if anemia can classify by clinical sign (Palmer, Mucus Membrane Pallor)

The World Health Organization (WHO) has estimated that 43 per cent of the world's children up to 5 years of age are anemic (defined as a hemoglobin concentration <11.0 grams). The prevalence exceeds 50% in the young children of Asia and Africa. 10% in developed countries despite the fact that iron is forth most common element on earth Iron deficiency is the commonest nutrient deficiency worldwide and the commonest cause of anemia, but it is of course not the only cause of anemia. Malaria, hookworm, Bilharzias, and helicobacter pylori gastritis play an important role in tropical climates, as do haemoglobinopathies like sickle-cell anemia and thalassaemia, hemolytic anemia's such as glucose -6- phosphate dehydrogenase deficiency(G6PD).Iron deficiency anemia affect child behavior and development and also associated with delay in psychomotor development. Randomized controlled trials of iron therapy have shown benefits by reversing cognitive deficits in anemic children although concerns still exist that iron deficiency at a critical stage of brain development in early life may have irreversible negative consequences on child development. Iron deficiency may also increase susceptibility to infection by impairing lymphocyte function as well as the more general effects of fatigue, lethargy, and irritability. The prevention of iron deficiency in young children is therefore a high public health priority in developing countries but it is also equally important in poor inner city children and in the children of ethnic minority communities living in the developed world[2,3,4.]

Anemia may be detected by clinical examination for pallor of the palmer or oral mucosa pallor. The WHO Integrated Management Childhood Illness (IMCI) strategy has recommended palmer pallor as an important sign of anemia . In this research we used palmer pallor and mucous membrane pallor to detect and classification of anemia **"Screening Test".**By comparison palm of a child which open gently and not stretch of fingers in order to not give false pallor with palm of doctors or parents or another child Look to lower lip mucosa by gently stretch it down to see pallor .Classification of pallor to sever pallor or some pallor of M.M or palm or both

Classification of anemia to : -* sever –anemia if sever palmer or sever mucous membrane or both *Anemia if some palmer or some mucous membrane or both. *No anemia if no pallor[(1,2,3)]

_Used HB lab; investigation " **Diagnostic Test** we put 11 grams stander < 11 grams means anemia or >= 11 grams means no anemia[(1,2)]

_Used questioner for research and the number of cases of a children age two months up to five years 500 cases in out clinic in Naim Health Center in the evening clinic to Bahraini and Non-Bahraini child

AIMS

-Evaluation if anemia can diagnosed and classification by clinical sign ,Evaluation the prevalence of anemia in a children's age 2 months up to 5 years in Bahrain and non-Bahrain child in relation to sex and age and -Treatment and follow up of anemia cases

MATERIALS AND THE METHODS

In Naim Health Center in evening clinic – Manama which service patient of capital and north governorate. Study of children Two months up to five years which responsible about 15% of population 500 cases, Prospective , criteria of sample children 2 month up to 5 years at Naim health center room 1 evening clinic from August 2003 until November 2003 for Bahrain and non Bahrain child from 5 pm to 9 pm (the time of lab services) to all children expect parents refuse. Collection of information's by 1.Questionair 2.Laboratory test HB 3Information about G6PD, HB electrophoresis by computerized from the laboratory.4- data analysis and statistic by spas program. and Ethical consideration parents agreement before including in the study

THE RESULTS

This research about 500 cases Bahrain 396 cases (79.2%) and non Bahrain 104 cases(20.8%). Male 297 cases (59.4%) and female 203 cases (40.6%) and age groups 2 months up to one year 112 cases (22.4%),1 year up to 2 years 141 cases(28.2%). And 2 years up to 5 years 247 cases(49.4%). The % of non Bahrain cases represents same % of national statistic. classification of anemia by hemoglobin HB >=11GM about 38.0% means that no anemia and HB<11GM about 62.0% means that anemia and 11 grams is the standard as show table 1.classification of anemia by clinical sign no anemia means that no pallor 38.2% and anemia means that some pallor (palmer and mucus membrane) and sever anemia means that sever pallor(palmer and mucus membrane)0.4% as show table no. 2. There is equal in % of anemia and no anemia by clinical sign and HB lab. shows in table no.1 and 2. Right classifications of anemia 49.8% and no anemia 26.4% and sever anemia 0.4% totally 76.6% show in table no.3.

- % of anemia right classify by clinical sign = 249 X 100 / 310 = 81%.
- % of no anemia right classify by clinical sign =132 X 100 /190 = 69%.

-Right and wrong classification shows in table no.4.

-Wrong classification equal in % between over estimation 11.8% and under estimation 11.6 % and no difference in sensitivity of palmer and mucus membrane pallor

-From entering CPR to computer of the lab. There are % of not asking of G6 PD about 56% and % of not asking HB electro phrases in Bahrain child 57%

-The pattern of hemoglobin in Bahrain and non Bahrain child HB of Bahrain less than non Bahrain show in table no.5.

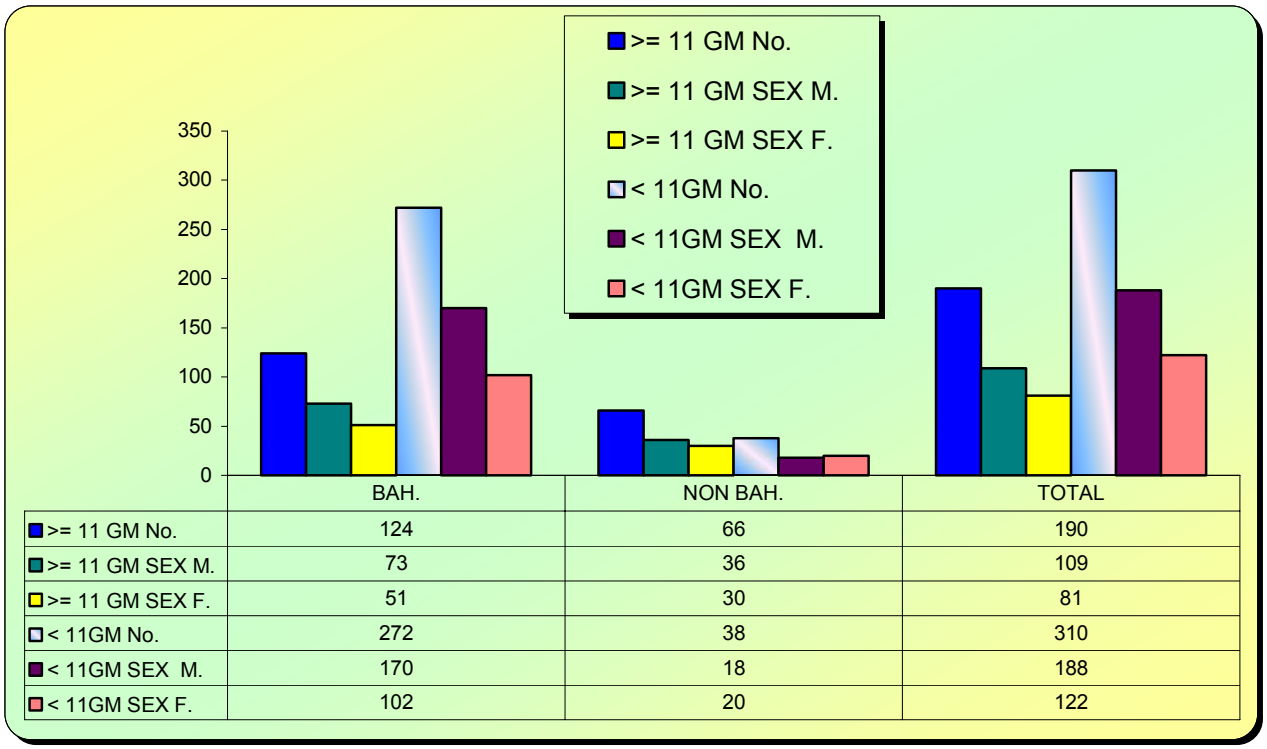
_The pattern of wrong classification and we consider 0.1% over or below 11 grams (standard) wrong classification we show that most of the wrong cases below (38 cases) and above (46 cases) concentrated around 11 grams from total 117 cases. Show in table no.6

_The complaint show more of 5 main complain (cough- fever –throat pain- ear pain – diarrhea) due to decrease immunity show in table no.7.

TABLE 1: SHOW HB LEVEL IN BOTH BAH & NON BAH ALSO TOTAL CASES CLASSIFIED ON SEX.

	>= 11 GM			< 11GM		
	NO.	SEX		NO.	SEX	
		M.	F.		M.	F.
BAH.	124	73	51	272	170	102
NON BAH.	66	36	30	38	18	20
TOTAL	190	109	81	310	188	122

	%			%		
BAH.	24.8%	14.6%	10.2%	54.4%	34.0%	20.4%
NON BAH.	13.2%	7.2%	6.0%	7.6%	3.6%	4.0%
TOTAL	38.0%	21.8%	16.2%	62.0%	37.6%	24.4%



	BAH.	NON BAH.	TOTAL
>= 11 GM No.	124	66	190
>= 11 GM SEX M.	73	36	109
>= 11 GM SEX F.	51	30	81
< 11GM No.	272	38	310
< 11GM SEX M.	170	18	188
< 11GM SEX F.	102	20	122

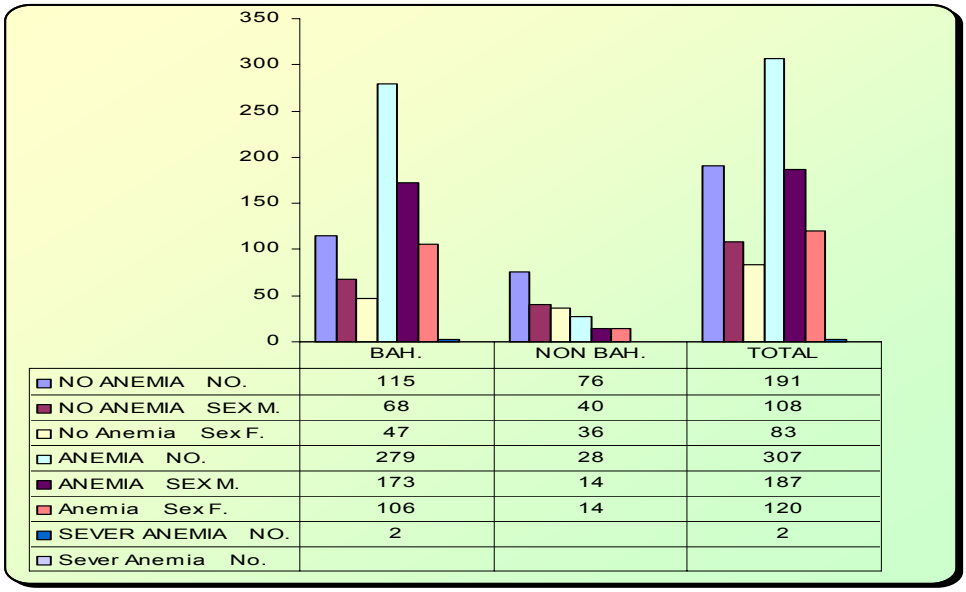
GRAPH 1 : SHOW HB LEVEL IN BOTH BAH & NON BAH ALSO TOTAL CASES CLASSIFIED ON SEX.

✍ 11 GRAMS STANDARD ABOVE OR EQUAL MEANS NO ANEMIA (38%) AND UNDER 11 GRAMS MEANS ANEMIA (62%)

✍

TABLE 2: SHOW CLASSIFICATION ON ANEMIA BY CLINICAL SIGN RELATED TO SEX.

	NO. ANEMIA			ANEMIA			SEVER ANEMIA
	NO.	SEX		NO.	SEX		
		M.	F.		M.	F.	NO.
BAH.	115	68	47	279	173	106	2
NON BAH.	76	40	36	28	14	14	
TOTAL	191	108	83	307	187	120	2
	%			%			%
BAH.	23.0%	13.6%	9.4%	55.8%	34.6%	21.2%	0.4%
NON BAH.	15.2%	8.0%	7.2%	5.6%	2.8%	2.8%	0.0%
TOTAL	38.2%	21.6%	16.6%	61.4%	37.4%	24.0%	0.4%

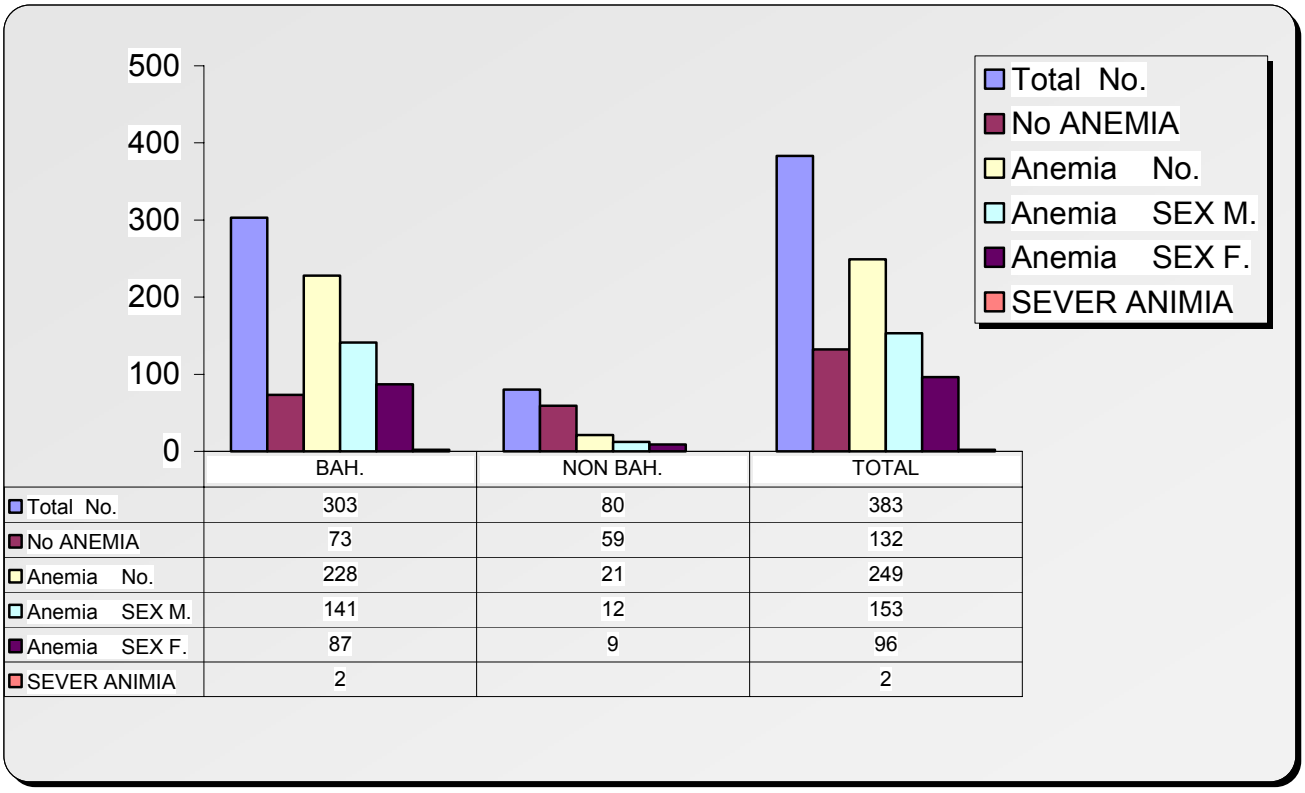


GRAPH 2: SHOW CLASSIFICATION ON ANEMIA BY CLINICAL SIGN RELATED TO SEX.

- ANEMIA BY CLINICAL SIGN
  (ANEMIA + SEVER ANEMIA) = 61.4% + 0.4%=61.8%
- NO ANEMIA BY CLINICAL SIGN (38.2%)

TABLE 3: SHOW RIGHT CLASSIFICATION

	TOTAL NO.	NO ANEMIA	ANEMIA			SEVER ANEMIA
			NO.	SEX		
				M.	F.	
BAH.	303	73	228	141	87	2
NON BAH.	80	59	21	12	9	
TOTAL	383	132	249	153	96	2
	%	%	%	%	%	%
BAH.	60.6%	14.6%	45.6%	28.2%	17.4%	0.4%
NON BAH.	16.0%	11.8%	4.2%	2.4%	1.8%	0.0%
TOTAL	76.6%	26.4%	49.8%	30.6%	19.2%	0.4%



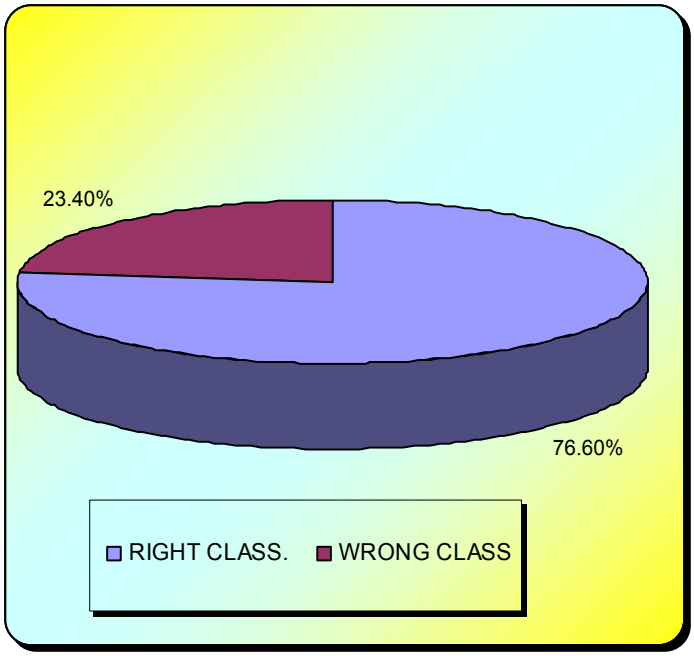
	BAH.	NON BAH.	TOTAL
Total No.	303	80	383
No ANEMIA	73	59	132
Anemia No.	228	21	249
Anemia SEX M.	141	12	153
Anemia SEX F.	87	9	96
SEVER ANIMIA	2		2

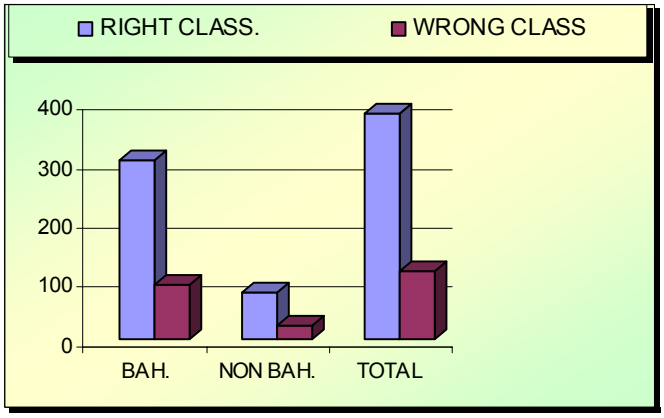
GRAPH 3 : SHOW RIGHT CLASSIFICATION.

✍ COMPARESON BETWEEN CLINICAL SIGN AND HB. INVESTIGATION WE FOUND THAT RIGHT CLASIFICATION 76.6% .

TABLE 4: RIGHT& WRONG CLASSIFICATION

	TOTAL	RIGHT CLASS.	WRONG CLASS.
BAH.	396	303	93
NON BAH.	104	80	24
TOTAL	500	383	117
	%		
BAH.	79.2%	60.6%	18.6%
NON BAH.	20.8%	16.0%	4.8%
TOTAL	100.0%	76.6%	23.4%

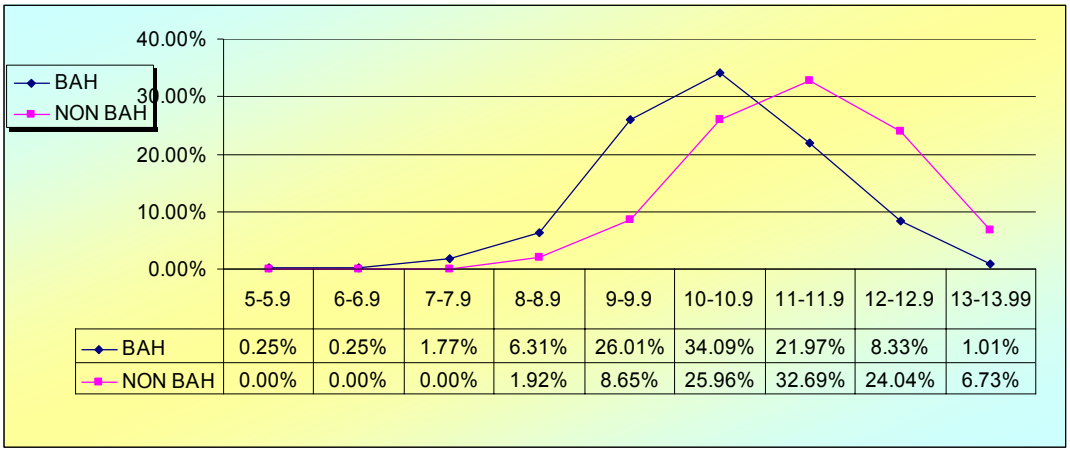




GRAPH 4 : RIGHT& WRONG CLASSIFICATION

TABLE 5: SHOW HB PATTERN BY % IN TOTAL CASES OF BAH AND NON BAH.

GM	5-5.9	6-6.9	7-7.9	8-8.9	9-9.9	10-10.9	11-11.9	12-12.9	13-13.99	TOTAL
BAH	0.25%	0.25%	1.77%	6.31%	26.01%	34.09%	21.97%	8.33%	1.01%	396
NON BAH	0.00%	0.00%	0.00%	1.92%	8.65%	25.96%	32.69%	24.04%	6.73%	104

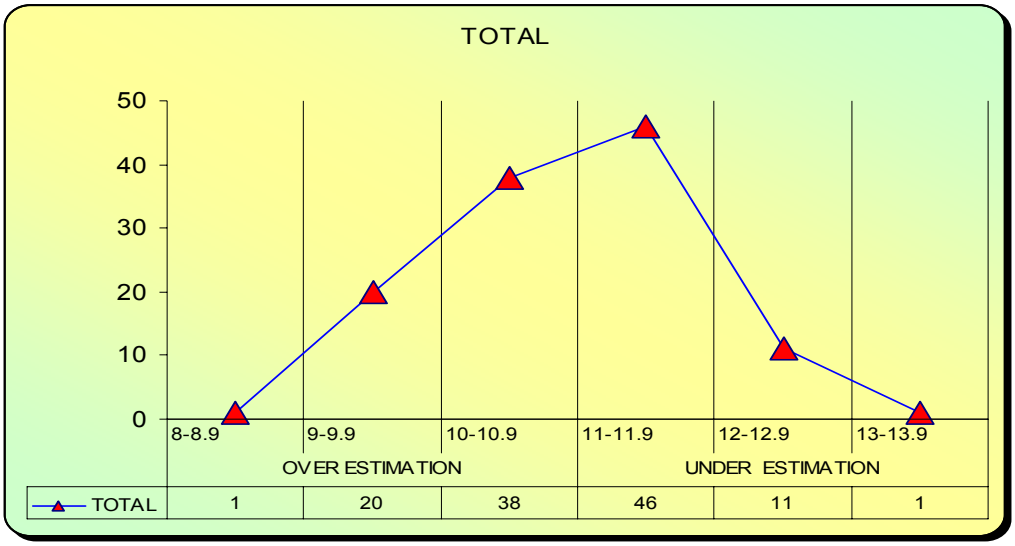


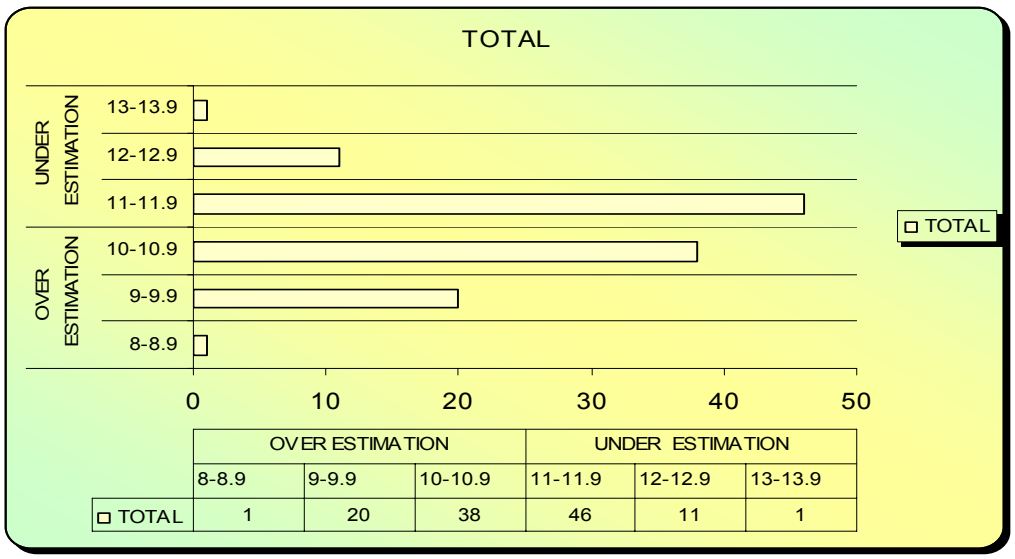
GRAPH 5: SHOW HB PATTERN BY % IN TOTAL CASES OF BAH AND NON BAH.

- MOST ELEVATEAD POINT OF HB. BAH. WITHIN (10-10.9) BUT NON BAH. HB. WITHIN (11-11.9) AND MORE.

TABLE 6 : WRONG CLASSIFICATION

	OVER ESTIMATION			UNDER ESTIMATION		
	8-8.9	9-9.9	10-10.9	11-11.9	12-12.9	13-13.9
BAH	0	16	26	42	8	1
NON BAH	1	4	12	4	3	0
TOTAL	1	20	38	46	11	1
	59			58		



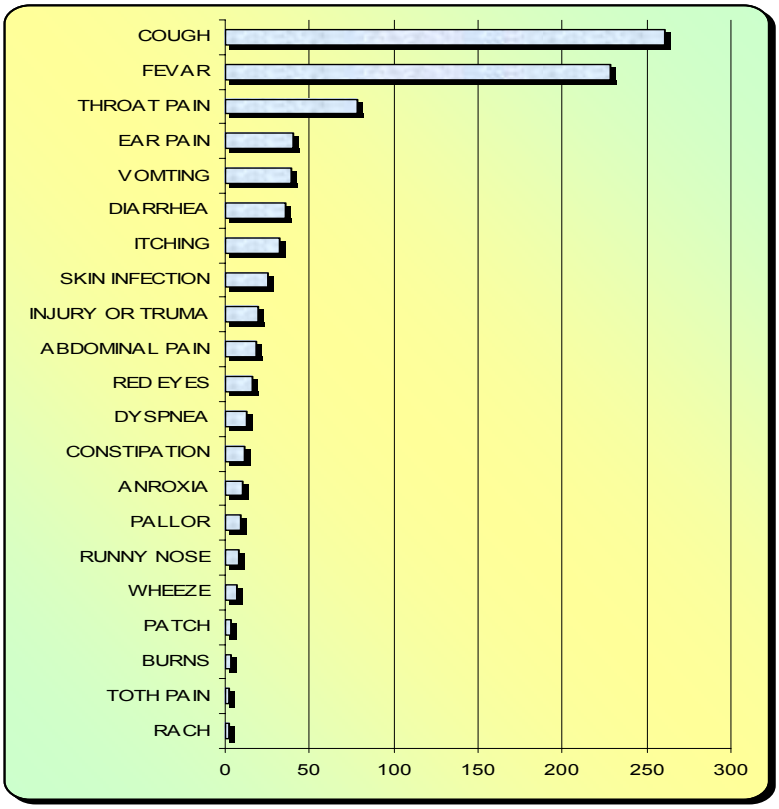


GRAPH 6 : WRONG CLASIFICATION

✍ WE CONSIDER 0.1% OVER OR BELOW 11 GRAMS (STANDARD) WRONG CLASIFICATION WE SHOW THAT MOST OF THE WRONG CASES BELOW (38 CASES) AND ABOVE (46 CASES) CONSITRATED AROUND 11 GRAMS FROM TOTAL 117 CASES.

TABLE 7: SHOW COMPLAIN

SER	COMPLAIN	**TOTAL**
1.	COUGH	261
2.	FEVAR	228
3.	THROAT PAIN	79
4.	EAR PAIN	40
5.	VOMTING	39
6.	DIARRHEA	36
7.	ITCHING	32
8.	SKIN INFECTION	25
9.	INJURY OR TRUMA	20
10.	ABDOMINAL PAIN	19
11.	RED EYES	16
12.	DYSPNEA	13
13.	CONSTIPATION	11
14.	ANROXIA	10
15.	PALLOR	9
16.	RUNNY NOSE	8
17.	WHEEZE	7
18.	BURNS	3
19.	PATCH	3
20.	RACH	2
21.	TOTH PAIN	2

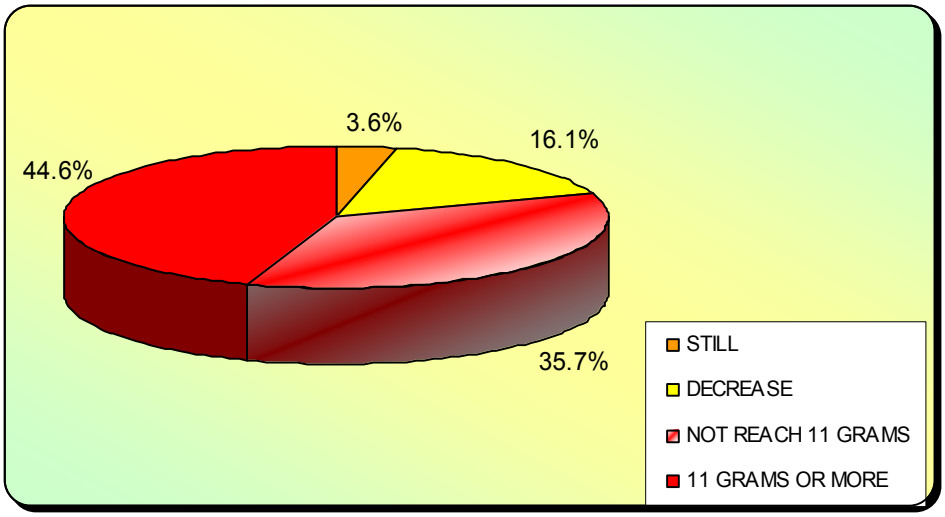


GRAPH 7: SHOW COMPLAIN

SHOW MORE OF 5 MAIN COMPLAIN (COUGH- FEVER- THROT PAIN- EAR PAIN – DIARRHEA) DUE TO DECREASE IMMUNITY.

TABLE 8: FOLLOW UP (F/ UP) CASES OF ANEMIA.

TOTAL NO. OF CASES	NO. OF VISIT			HB. LEVEL					
						INCREASE			
	2ND	3RD	4TH	STILL	DECREASE	NO.	NOT REACH 11 GRAMS	11 GRAMS OR MORE	
56	56	13	3	2	9	45	20	25	
	100%	23.2%	5.4%	3.6%	16.1%	80.4%	35.7%	44.6%	



GRAPH 8: FOLLOW UP (F/ UP) CASES OF ANEMIA.

NOT ALL TRATEMENT CASES O ANEMIA REACH TO STANDARD LEVEL NEEDS MORE FOLLOW UP.

-Follow up cases of anemia and not all treatment cases of anemia reach to standard level needs more follow up show in table no.8

-There is relation between anemia and low weight in non Bahrain show in table no.9.

TABLE no.9 : CLASSIFICATION OF ANEMIA IN RELATION TO WEIGHT						
NATION.	LOW			NOT LOW		
	ANEMIA	NO ANEMIA	TOTAL	ANEMIA	NO ANEMIA	TOTAL
BAH.	72	34	106	200	90	290
NON BAH.	16	25	41	22	41	63
TOTAL	88	59	147	222	131	353

-Comparison between anemia in Bahraini and non Bahraini child in relation to age and sex show in table no.10.

Total % of Bahrain	♂	♀	2 months up to 1 year	1 year up to 2 years	2years up to 5 years
68.7 %	69.9 %	66.7%	77%	68%	64%
Total % of non Bahrain.	♂	♀	2 months up to 1 year	1 year up to 2 years	2years up to 5 years
36.5%	33.3%	40%	43.7	37.9%	33.9%

Table no.10

Discussion:

From the result anemia can diagnosed and classify by clinical sign (palmer – mucus membrane pallor) we found that by using the clinical sign anemia cases 307 "61.4%", no anemia 191 cases "38.2%" and sever anemia 2 cases "0.4%".

By using HB investigation anemia cases 308 cases "61.6%" , no anemia cases 190 "38.0%" and sever anemia 2 cases "0.4%". This means that randomly equal in % between clinical and HB laboratory investigation, but **Wright** classification of anemia 249 cases "49.8%" no anemia 132 "26.4%" and sever anemia 2 cases "0.4%" totally "76.6%".

There are a research in Uganda and Bangladesh to evaluation of clinical sign to diagnose anemia the number of cases 1226 and 668 children age 2 months to 5 years but used pallor of palm and conjunctiva. And diagnosed 79% of anemia and 50% of no anemia .

In this research diagnosed 81% of anemia and 69% of no anemia may be due to difference in methods used and difference in colour.

Wrong classification over estimation 59 cases "11.8%" that by clinical no anemia and by laboratory under 11 grams. Under estimation 58 cases "11.6%" that by clinical anemia by laboratory equal or over 11 grams. Total wrong classification 117 cases "23.4%"

The wrong classification 117 cases "23.4%" from them 84 cases that present around 11 grams 38 cases from 10-10.9 grams and 46 cases from 11-11.9 grams. In this research we considers that 0.1% over or under 11 grams means wrong classification .Under estimations 58 cases which means that by HB investigations 11 grams or more taken treatment of anemia there is no problem because most of Bahraini cases HB pattern not more than non Bahraini. There is equally in % of wrong classification over, under estimation there is no difference in the sensitivity of palmer pallor and mm pallor and both That under estimation about 58 cases "11.6%" that "4.0%" by palmer pallor , "4.0%" mm pallor "3.6%" both.

Bangladesh research conjunctiva pallor more sensitive than palmer pallor may be due to black colour skin.

- Evaluation the prevalence of anemia in Bah, non Bah in relation to age Anemia in all cases307cases(62%) in Bah, non Bah… anemia in Bah cases * total number of Bahraini cases = 396.(79.2%) * total number of anemia cases = 272.(54.4%).% of anemia in Bah child = (272* 100) / 396 = 68.7 %. anemia in relation to sex 1st ♂… Number of ♂ 243 cases (48.6%) Number of anemia in ♂ 170 cases (34%)… % of anemia in ♂: (170 * 100) / 243 = 69.9%.2nd ♀… Number of ♀ cases 153 (30.6%)… Number of anemic cases 102 (20.4%).% of anemia in ♀ (102 * 100) / 153= 66.1%.*-Anemia in relation to age:

---Age two months up to1 year… Number of cases 96 (19.2%)…Number of anemia 74 (14.8%)…% of anemia in age 2 months to 5 years (74 * 100) / 96= 77%.---Age 1 year up to 2 years…Number of cases 112 (22.4%)…Number of anemia 77 (15.4%)…% of anemia in age 1 year to 2 years (77 * 100) / 112 = 68%.---Age 2 years up to 5 years Number of cases 188 (37.6%)… Number of anemia cases 121 (24.2%)… % of anemia in age 2 years up to 5 years (121 * 100) / 188 = 64%.*Anemia in non Bah cases:…Total number of non Bah cases 104 (20.8%)…Total number of anemia cases 36 (7.2%)…% of anemia in non Bah cases (38 * 100) / 104 = 36.5%.*---Anemia in relation to sex…1st ♂…Number of ♂ cases 54 (10.8%)…Number of anemia cases in ♂ 18 (3.6%)…% of anemia in non Bah ♂ (18 * 100) / 54 = 33.3%.---2nd ♀ …Number of ♀ cases 50 (10%)…Number of anemia in ♀ 20 (4%) …% of anemia in non Bah ♀ (20 * 100) / 50 = 40%

*Anemia in relation to age…Age 2 months up to 1 year…% of anemia in age 2 months up to 1 year (7 * 100) / 16 = 43.7%...Age 1 year up to 2 years …% of anemia in age 1 year up to 2 years (11 * 100) / 29= 37.9%... Age 2 years up to 5 years …% of anemia in age 2 years up to 5 years (20 * 100) / 59 = 33.9%.

* we found that: Anemia more in ♂ than ♀ in Bah but in ♀ more than ♂ in non Bah
By age more in age 2 months up to 1 year in both Bah and non Bah. % of low weight cases in Bah, non Bah….Both Bah, non Bah (147 * 100) / 500 =29.4%...Bah cases (106 * 100) / 396 = 26.8%...Non Bah (41*100) / 104 = 39.4%
Relation between anemia and weight…in Both Bah, non Bah in Anemia with :Low weight (88 * 100) / 310 = 28.4%...And Anemia with Non- low weight (222 * 100) / 310 = 71.6
% of anemia right classify by clinical sign = 249 X 100 / 310 = 81%.% of no anemia right classify by clinical sign =132 X 100 /190 = 69%.NB. % of anemia in Bangladesh by clinical sign 79% and no anemia 50%.
* Bahrain Anemia cases with :Low weight (72 * 100) / 272 = 26.4% and Bahrain Anemia cases with Not- low weight (200 * 100) / 272 = 73.6% and * Non-Bahrain…Anemia cases with :Low weight (16 * 100) / 38 = 42% and Anemia cases with Not- low weight (22 * 100) / 38 = 58% For the result we found that: * Bahrain Child less % in low weight 26.8% and… Bahraini an child less % in anemia with low weight 26.4%.
* Non Bah child high percent in low weight 39.4%...Non Bah child high percent anemia low weighs 42%
From the result present 5 main symptoms of cough –fever – Throat problem – ear problem – diarrhea represents the most complain of the cases in the out clinic of patient because anemia affects immunity system.

Conclusion

Anemia can classify by clinical sign and this method is valid, Anemia more in male than female in Bahrain child, Anemia more in age 2 months up to one year if used clinical sign in every child care visits to treatment can decrease the prevalence of it.,
Nutritional anemia mainly due to less food rich iron and less breast feeding and failure of iron syrup treatment, must be increase of hemic and no hemic iron in foods. Intake, More five main symptom (cough – diarrhea – throat infection – ear infection – fever) due to decrease immunity which affected by anemia ,There are relation between anemia and low weight in non Bahrain child ,There are decrease in investigation of G6PD- HB electrophoresis must be complete to every child at the end of first year.

Recommendation

-Obligatory check every child age 2 months up to 5 years for anemia from all physicians in primary health care P.H.C. in crowded clinic by using clinical sign.
-Treatment and follow up “f/up” of anemia cases according to guideline and dose. After training of family physician staff and nurses in I M C I programme using clinical sign
.- Feeding Assessment to all anemic patients and solve any feeding problems-Breast feeding assessment for all children under 2 months in post natal care.
-Child Care: Hemoglobin investigation in 9 months. And We recommended that clinical examinations of every child in every visits and treatment him after asking about history of genetic anemia.
-Prophylaxis iron dose to all children no anemia age 6 months to 30 months one dose only weekly.
- special food rich iron to children and increase eating of fruit, vegetables and vit.c in take and decrease tea intake. And more eating in hemic and non holmic foods. and avoid food that decrease iron absorptions
-. Treatment of failure of iron syrup child. wrong believes that iron affect teeth and Palatable of iron syrup.
- Health education by :mass media, face to face and Posters to aware population of the problem.
-Audit in all Health Center for anemia under supervision of central administration.
-Must be every child after one year knowledge about G6PD, HB electrophoresis.

REFRENCE

1. WHO / UNISEF/MOHP OF EGYPT Chart booklet of IMCI and Assessment and classification of sick child age two months up to five years module .
2. Oxford university press journal of tropical pediatric vol. 45 december 1999.
3. http://www.pitt.edu/super1/lecture/lec0641/005-032htm
4. Iron deficiency anemia in infant and children http://www.allsands.com/kids/health anemia in child bsy gn.htm
5. Anemia :an approach to the diagnosis Thomas@deloughery Associate Professor of medicine march 15,1999.
6. American family physician common ,uncommon anemia February 15, 1999 – American academy of family page 1 of 10.
7. Medical encyclopedia for paleness and iron deficiency anemia
8. Primary care Pakistan integrated approach to the sick child.
9. Text book of pediatric volume 2 edited by Jottn & Forfar Gauin CA Rueil Third edition page 1317 –1319 "1989"
10. Tutorials in pediatric Differential diagnoses edited by David J Field , David Isaacs , John Stroobant page 97—100 1989.
11. Principles and practice of clinical pediatric edited by M.William , Edward B. Charney, Thomas A Curry ,Stephen Ludwig page 3.3—3.5
12. Nelson –Text book of pediatric 14th edition page 1239 – 1241 1992.
13. Practical pediatric problem sixth edition edited by James H . Hutchison and Forrestor Cockburn 1986.
14. Pediatric and child health. A Hand book for hills professional in third word edited by H.M.Coovadia , W E K Loening. Page 334-339 1988.
15. current pediatric diagnosis and treatment edited by Hay grootheus , Haryword Levin. Page 819 -824. 1994.
16. Practical pediatric problem sixth edition edited by Hutchison and Cockburn. page 486 -489. 1986
17. Hand book of pediatrics edited by Silver , Kombe ,Bruryn, Fulginit. Page 410-413. 1987.
18. Test book of pediatric in tropical and subtropical edited by PMBarnes, Hargit Singh , A J H . Stephen. Page 159 – 161. 1990.
19. Child Health in the topics edited by D.B.Jelliffe. page 83-89.1985.