

MEAN HAEMATOLOGICAL VALUES IN ILL INFANTS AND PRE-SCHOOL CHILDREN IN CAPE TOWN*

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Previous investigations showed that iron-deficiency anaemia occurred commonly in apparently healthy infants and pre-school children in the 3 main racial groups in Cape Town. Treatment of these subjects with various oral iron preparations was followed by a significant rise in the haemoglobin level. Routine haemoglobin estimations of ill infants and children showed that they also frequently had low haemoglobin levels. In view of these findings it seemed important to determine haematological values in a series of these ill subjects.

MATERIAL

Haemoglobin estimations were done on 849 consecutive non-White infants and children attending the Out-patient Department of the Red Cross War Memorial Children's Hospital, Cape Town. Blood smears were examined and packed cell volumes and mean corpuscular haemoglobin concentration values determined in 100 of these patients whose haemoglobin

levels were 0.5 g. per 100 ml. below the lowest figure accepted by Wintrobe as normal for each age group. Of the 849 patients, 501 were Cape Coloured and 348 were African. Their ages ranged from 1 week to 6 years. As relatively few White patients attend the hospital they were not included in this investigation. In a sample of 332 of these out-patients, 49.7% of Cape Coloured and 58.7% of African infants were breast-fed up to at least the end of the third month of age.

The mean weekly income of the head of the family was £4.12 for the Cape Coloured patients and £3.16 for African patients. These figures indicate that the Cape Coloured infants and children were from the 'low income' group and the Africans from the 'medium income' group in their respective sections of the community.

The patients were taken *seriatim* from those attending the out-patient department for various ailments. They did not present primarily as cases of anaemia. The majority of illnesses were acute and usually the duration had not been more than a few days when the patient was brought to hospital. The illnesses were mainly infections, of all grades of severity. Any out-patient who showed clinical signs of dehydration or who had a blood dyscrasia was excluded. The patients investigated

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had not received iron other than that which was present in their usual diet.

TABLE I. COMPARISON OF MEAN HAEMOGLOBIN LEVELS IN ILL CAPE COLOURED AND AFRICAN INFANTS AND CHILDREN FROM 1 WEEK TO 7 YEARS OF AGE

Age	Cape Coloured			African		
	No. of cases	S.D.	Mean Hb. g. %	No. of cases	S.D.	Mean Hb. g. %
<i>Months</i>						
1 - 1	17	3.06	14.44	2	—	14.25
1 - 2	28	2.44	11.42	13	3.93	11.35
2 - 3	28	1.23	9.88	17	0.95	10.57
3 - 4	45	1.22	9.99	31	1.40	10.37
4 - 5	35	1.43	10.19	30	1.45	10.54
5 - 6	33	1.51	9.97	12	1.02	10.38
6 - 7	33	1.61	10.27	16	1.04	9.94
7 - 8	36	1.75	10.05	27	1.47	9.97
8 - 9	25	1.55	9.79	16	1.63	9.96
9 - 10	27	2.11	9.43	11	1.27	9.74
10 - 11	22	2.13	9.47	24	2.03	9.34
11 - 12	28	1.67	9.14	14	1.88	9.82
<i>Years</i>						
1 - 2	49	1.98	8.81	46	1.83	9.47
2 - 3	29	1.58	9.37	25	2.09	9.42
3 - 4	11	1.44	9.99	21	1.44	11.01
4 - 5	15	1.23	10.71	18	1.00	10.82
5 - 6	20	1.96	10.66	12	0.84	11.00
6 - 7	20	1.31	10.73	13	1.24	11.39

TABLE II. COMPARISON OF MEAN HAEMOGLOBIN LEVELS IN CAPE COLOURED AND AFRICAN INFANTS AND CHILDREN FROM 1 WEEK UP TO 7 YEARS OF AGE IN APPARENT HEALTH AND ILLNESS

Age	Cape Coloured		African	
	Ill Hb. g. %	Healthy Hb. g. %	Ill Hb. g. %	Healthy Hb. g. %
<i>Months</i>				
1 - 1	14.44	14.44	14.25	14.85
1 - 2	11.42	12.10	11.35	12.15
2 - 3	9.88	10.45	10.57	11.10
3 - 4	9.99	10.27	10.37	10.83
4 - 5	10.19	10.35	10.54	10.82
5 - 6	9.97	10.75	10.38	10.57
6 - 7	10.27	10.35	9.94	10.29
7 - 8	10.05	10.14	9.97	10.40
8 - 9	9.79	9.72	9.96	10.03
9 - 10	9.43	9.80	9.74	10.15
10 - 11	9.47	9.81	9.34	9.87
11 - 12	9.14	9.57	9.82	9.84
<i>Years</i>				
1 - 2	8.81	9.31	9.47	9.76
2 - 3	9.37	10.13	9.42	10.61
3 - 4	9.99	10.59	11.01	10.63
4 - 5	10.71	11.00	10.82	11.12
5 - 6	10.66	11.03	11.00	11.18
6 - 7	10.73	11.19	11.39	11.82

METHODS

Blood for haemoglobin estimation was taken by heel-prick from infants and by thumb-prick from older children, using a triangular cutting needle which gave a free, unrestricted flow without external pressure of any kind. The haemoglobin estimations were done by the oxyhaemoglobin method, using a Klett-Summerson colorimeter previously calibrated against standard haemin and cyanmethaemoglobin solutions.

Blood for packed-cell-volume determinations was taken from the internal jugular vein of infants and the anterior cubital vein of older children, and the estimations were made by the standard Wintrobe procedure.

Blood smears were stained by the May-Grünwald Giemsa method.

RESULTS

The mean haemoglobin levels in ill Cape Coloured and African infants and pre-school children are shown in Table I. Table II compares the mean haemoglobin levels in these ill Cape Coloured and African infants and pre-school children with the mean haemoglobin levels determined in apparently healthy infants and children. The mean haemoglobin values in the ill subjects were lower than the mean values in apparently healthy infants and pre-school children in Cape Town. Also, they were lower in the Cape Coloured than in the African in almost all age-period groups.

Some of the blood smears showed normal red blood corpuscle morphology while others showed the features of iron-deficiency anaemia. The lower the haemoglobin value the more likely was the smear to reveal the features of iron-deficiency anaemia.

The results of the average haemoglobin, packed cell volume and mean corpuscular haemoglobin concentration values in the 100 cases having haemoglobin levels 0.5 g. per 100 ml. below the lowest Wintrobe normal are shown in the table below:

	Mean value	Range	Standard deviation
Haemoglobin g. %	8.35	2.3 - 10.9	1.76
PCV %	31.35	8 - 45	6.56
MCHC %	26.30	17 - 31	2.79

The low mean corpuscular haemoglobin concentration in each case confirmed the presence of iron-deficiency anaemia in every infant and child in this group.

CONCLUSIONS

1. The mean haemoglobin levels in these ill Cape Coloured and African infants and pre-school children were found to be lower than the mean values in apparently healthy infants and children.

2. The mean levels in the ill Cape Coloured subjects were lower than in the Africans in almost all age-period groups.

3. The more detailed blood studies on the 100 infants and children indicated that these low haemoglobin levels were manifestations of iron-deficiency anaemia.

4. The fact that none of the cases presented symptoms of anaemia despite the low haemoglobin levels emphasizes the insidious nature of onset and slow progress of iron-deficiency anaemia in infants and children and stresses the need to administer prophylactic iron to ill infants and children.

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