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A Haematological Study of the Vokkaligas of Mysore

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INTRODUCTION

It is well established fact that the standard norms in haematology vary with different ethnic groups, depending upon the socio-economic status of the people and geographic conditions prevalent in that part of the country.

Though numerous research studies (Wintrobe, 1967; Morgan, 1970; Cole and Evans, 1972; Gammon and Baker, 1977; Woodliff, 1979; Weir, 1983; Gujral et al., 1989; Mardar et al., 1990; Munster et al., 1997 and Sikosana et al., 1998) have been carried out in foreign countries on haematological norms in population of different areas, of different ethnic groups and different socio-economic status. The haemoglobin level in Indian population has been reported significantly below the standard normal values of Europeans an Americans. In India also few studies have worthwhile contribution in this sphere being those of Parkash (1973); Bhatnagar (1975) and Singh (1986).

In the medical literature there are not much studies available especially in this part of the country. The Vokkaligas constitute a different caste system and with this point of view it is proposed to undertake the present study of haematological normal values in Vokkaligas of Mysore.

MATERIALS AND METHODS

The present study is based on a cross sectional sample of 100 Vokkaligas (90 males, 10 females) of Mysore ranging in age from 6 to 20 years. The data have been collected mostly from schools of Belvadi and kurgarli villages of Mysore.

Mysore occupies a central position in the Southern part of India and has tropical climatic conditions as the tropic of cancer passes through this area. Its temperature varies from 12°C in winter to 27°C in summer. The winter season is of very short duration. Because of the coastline, Mysore is engaged in the development of fishing and boat building activities. The main occupation of Vokkaligas is fishing and agriculture.

The haematological investigations carried out on each subject were: haemoglobin estimation, total red blood cell count, total leucocyte count and differential leucocyte count. The slides were also examined for malarial parasites. All the haematological investigations were carried out by following standard techniques given by Elwood and Jacobs (1966); and Weiner and Lourie (1969)

The data collected and analyzed for different haematological estimations have been arranged in one yearly age groups. Simple statistical tests have been applied to calculate mean, standard deviation and standard error of mean in both the sexes.

RESULTS AND DISCUSSION

The results in respect of haematological investigations i.e. haemoglobin level, total red blood cell count, total leucocyte count, differential leucocyte count and the presence of malarial parasite as determined in both the sexes are presented in table 1 and 2.

As is apparent from table 1, there is a trend of slight increase of haemoglobin level with advancement of age in males whereas in females a trend of decrease has been observed with increase of age, but these changes in haemoglobin level are not statistically significant. Parkash (1973) and Gujral et al., 1989) have also reported that age has no significant influence on haemoglobin level. The average value of haemoglobin in Vokkaliga males is 10.25 gm% and in females it is 9.56 gm%. In both the sexes the mean haemoglobin level has been found to be lowest when compared with other populations of India. It may be because the present population studied was of very low socio-economic group, which has great influence on haemoglobin level.

The red blood cell count has shown no consistent trend with the increase of age in both the sexes (Table 1 and 2). Its count varies from

Table 1: Haemoglobin level g /100 ml, total red blood cell count and total leucocyte count in Vokkaliga males and females of Mysore

Age (Yrs)	*No. of subjects*	*Haemoglobin g/100 ml*		*Total Red cell count (RBC) millions/cu mm*		*Total leucocyte count WBC /cu mm*	
		Mean	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
				Males			
6	4	9.00	0.41	4.67	0.87	7987	2417.90
7	6	10.63	2.77	4.64	1.48	6997	964.06
8	6	8.50	1.65	3.93	0.48	8133	1554.88
9	5	9.20	1.20	4.66	1.04	7720	1061.60
10	10	9.32	1.33	4.57	1.14	7895	2426.18
11	9	10.53	1.03	4.40	0.86	6327	1720.12
12	16	10.10	1.45	4.46	1.07	6843	1904.01
13	5	8.10	0.82	4.83	0.85	6400	1233.89
14	9	10.90	1.57	5.53	1.24	5711	1726.22
15	3	9.16	2.02	4.43	0.81	6883	901.84
16	6	10.63	1.64	5.01	0.94	7115	1598.64
17	1	9.50	–	6.53	–	5800	–
18	6	9.70	2.28	4.54	0.92	6883	1422.11
19	1	13.00	–	4.20	–	5950	–
20	3	10.20	1.04	3.82	0.27	7567	1257.31
				Females			
7	2	10.10	0.14	5.04	0.11	7650	919.23
8	2	8.30	1.13	4.23	0.23	6800	494.97
9	3	9.63	1.30	4.64	0.51	7416	1433.81
10	–	–	–	–	–	–	–
11	1	9.50	–	4.54	–	7400	–
12	1	9.10	–	3.03	–	4650	–
13	1	9.00	–	5.47	–	6300	–

3.82 to 6.53 millions/cu mm in males and it varies from 3.03 to 5.47 millions/cu mm in females in different age groups (Table 1). The mean value of red blood cell count is slightly higher (4.68 millions/cu mm) in males as compared to females (4.49 millions/cu mm). Wintrobe (1967), Parkash (1973) and Singh (1986) have also reported slightly higher values of the red blood cell count in males as compared to red blood cell count in females. The average value of red blood cell count in males of the present population is the lowest when compared with other populations of India. While comparing the average value of red blood cell count of the females with other populations it has been observed that mean value of 4.49 millions/cu mm is in close agreement with other studies. In high and middle socio-economic groups the red blood cell count as reported by Bhatnagar (1972) and Parkash (1973) is slightly higher than the present study.

The average value of total leucocyte count is 6947 /cu mm and 6702 /cu mm in males and females respectively. In males of the present study the total leucocyte count varies between 5711 to 8135 / cu mm while in females it ranged from 4650 to 7650 /cu mm (table 1). While comparing the total leucocyte count of males of the present study with other Indian populations it has been observed that present results are in close agreement with those reported by Bhatnagar (1972) and are lower than reported by Parkash (1973). The females of the present study also possesss lower values for total leucocyte count than other Indian Populations as reported by Parkash (1973). The low socio-economic level of the present sample may be responsible for lower values of total leucocyte count in Vokkaligas.

The percentages of differential leucocyte count are presented in table 2. The mean values of neutrophils have been found to be 56.3% in males and 54.9% in females. A trend of slight increase in the value of neutrophils percentage has been observed with the increase of age in both the sexes. The mean value of lymphocytes is 26.34%and 31.46% in males and females respectively. In males the percentage of

Table 2: Differential leucocyte count (percentages) in Vokkaliga males and females of Karnataka

Age (yrs)	*No. of sub-jects*	*Neutrophils%*		*Lymphocytes%*		*Monocytes%*		*Eosinophils%*		*Basophils%*	
		Mean	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D*	*Mean*	*S.D*
					Males						
6	4	51.00	7.43	33.00	7.43	7.25	1.50	5.25	2.62	0.50	0.50
7	6	54.00	3.63	25.16	4.70	6.50	2.42	6.30	3.72	0.66	0.14
8	6	58.33	11.58	28.14	10.38	4.50	1.64	4.30	1.36	–	–
9	5	54.20	2.05	31.40	7.70	6.00	3.19	4.80	1.78	0.40	0.22
10	10	55.20	7.46	27.30	7.07	5.60	2.91	5.50	2.50	0.40	0.48
11	9	52.44	8.29	30.55	9.68	7.10	1.53	4.40	2.29	0.44	0.68
12	16	59.20	7.72	22.80	7.54	6.10	2.89	5.40	2.75	0.25	0.43
13	5	55.20	4.54	25.40	5.17	7.30	4.33	7.40	3.13	0.60	0.61
14	9	58.00	6.06	27.28	5.24	6.60	2.65	5.10	1.61	0.33	0.46
15	3	59.60	8.96	20.66	4.04	7.30	2.30	6.60	2.08	0.66	0.46
16	6	52.30	2.73	30.50	5.99	8.70	3.61	6.00	3.52	0.50	0.50
17	1	52.00	–	26.00	–	6.00	–	8.00	–	1.00	–
18	6	58.00	4.60	26.66	5.12	6.50	2.34	3.66	1.86	0.66	0.14
19	1	62.00	–	22.00	–	7.00	–	4.00	–	0.00	–
20	3	63.3	4.04	19.60	3.51	6.30	2.51	5.60	2.51	1.00	–
					Females						
7	2	54.56	0.70	28.50	0.70	8.00	4.24	6.00	2.82	0.00	–
8	2	60.00	21.21	25.00	27.21	7.50	3.53	4.00	0.00	0.50	0.50
9	3	58.00	7.21	26.30	9.29	7.33	2.08	4.30	0.57	0.66	0.46
10	–	–	–	–	–	–	–	–	–	–	–
11	1	46.00	–	37.00	–	2.00	–	6.00	–	0.00	–
12	1	48.00	–	46.00	–	2.00	–	2.00	–	1.00	–
13	1	63.00	–	26.00	–	7.00	–	3.00	–	1.00	–

lymphocytes has a tendency to decrease with increase of age, whereas in females no trend has been observed. The mean values of monocytes are 6.4% and 5.9% in males and females respectively. The mean eosinophils count in males is 5.4% and in females the mean count is 4.2%. The mean value of basophils in males is 0.51% and count is 0.52%. It seems as if age has no effect on the value of monocytes, eosinophils and basophils. The average value for neutrophils, monocytes and eosinophils are larger in males and for lymphocytes and basophils the percentage values are larger in females. Parkash (1973) have reported that age has no influence on the percentage of differential leucocyte count. For comparison of differential leucocyte count, a little data is available on other Indian populations. The results of the present study are comparable to those reported by Parkash (1973).

KEY WORDS Malarial Parasite. Ethnic Group. Socio-economic status. Geographical Areas.

ABSTRACT The present study is based on a sample of 100 Vokkaligas (90 males, 10 females) ranging in age from 6 to 20 years. The blood specimens collected have been analyzed for different hematological parameters i.e. haemoglobin estimation, red blood cell count, total leucocyte count and differential leucocyte count. The slides have also been examined for the presence or absence of malarial parasites. Haemoglobin estimated by acid haematin method has been found to be 10.25gm% in males and 9.56gm% in females. A trend of increase in haemoglobin level has also been observed upto 17-18 years in males whereas in females the level of haemoglobin fell with the increase of age from 7 years. The red blood cell count is 4.68 million/cu mm in males and 4.49 million/cu mm in females. Total leucocyte count in males is 6947/cu mm and in females it is 6702/cu mm. No significant age changes have been observed in red blood cell count and total leucocyte count in both the sexes. The mean percentages of differential leucocyte count have been found to be: neutrophils (males 56.3%, females 54.9%) lymphocytes (males 26.43%, females 31.46%), monocytes (males 6.4%, females 5.9%), eosinophils (males 5.4%, females 4.2%), basophils (males 0.51%, females 0.52%). The percentage of neutrophils has increased with the increase of age in both the sexes, whereas percentage of lymphocytes decreases with age in males. Age changes seem to have no effect on the mean value of monocyte, eosinophils and basophils. The malarial parasite has been found in eight subjects (7 males and 1 female).

REFERENCES

Bhatnagar, D. P. *Immunization in Pregnant Women.* M.Sc. Diss. (unpublished) Punjabi University, Patiala (1972).

Cole, P. V. and P. Evans: Simple haemoglobin estimation. A comparison of available apparatus. *Anaesthesia,* **27(1)**: 76-80 (1972).

Elwood, P. C. and A. Jacobs: Haemoglobin estimation: a comparison of different techniques. *Brit. Med. J.,* **5478**: 20 - 4 (1966).

Gammon, A. and S.J. Baker: Studies in methods of haemoglobin estimation suitable for use in public health programmes. *Ind. J. Med. Res.,* **65(1)** : 150-6 (1977).

Marder, E., A. Nicoll, L. Polnay and C.E. Shulman. Discovering anaemia in child health clinics. *Arch. Dis. Childhood,* **65(8)** : 892-4 (1990).

Morgan, R. H.: Haemoglobin estimation in general practice. *Jr. Coll. Gen. Pract.,* **19(2)**: 140-2 (1970).

Munster, M., S. M. Lewis, L.K. Erasams and Mendelon B. V. Field evaluation of a novel haemoglobin measuring device designed for use in a rural setting. *S. Afr. Med. J.,* **87(11)**: 1522-6 (1997).

Parkash, S.: *A Survey Study for Establishing Norms in Respect of Routine Haematological Procedures Amongst Punjabi Adults*. Ph.D. Thesis (unpublished), Punjab University, Chandigarh (1973).

Sikosana, P. L., S. Bhebhe and S. Katuli: A prevalence survey of iron deficiency and iron deficiency anaemia in pregnant and lactating women, adults males and pre-school children in Zimbabwe. *Cent. Afr. J. Med.,* **44(2):** 297-305 (1998).

Singh, A. P. *Screening of the Newborns for Glucose 6-phospate Dehydrogenase (G6PD) Deficiency in Some of the Endogamous Groups and its Relation with the Blood Groups.* M.D. Thesis (unpublished), Punjabi University, Patiala (1986).

Weiner, J. S. and J.A. Lourie: Human Biology- *A Guide to Field Methods*. Blackwell Scientific Publications, Oxford (1969).

Weir, D. M. *Immunology.* ELBS 5th Ed. Churchill Livingstone, Edinburgh (1983).

Wintrobe, M. M. *Clinical Haematology*. Year Book Med. Publisher Inc., Chicago (1967).

Woodliff, H. J. Haemoglobinometry in Papua New Guinea. *P. N. G. Med. J.,* **22(4):** 43-6 (1979).

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