J. Hum. Ecol., 17(2): 157-158 (2005)
PRINT: ISSN 0970-9274 ONLINE: 2456-6608
DOI: 10.31901/24566608.2005/17.02.12

Occurrence of β - Thalassaemia Among the Sindhi Community of Jabalpur, Madhya Pradesh (Central India)

P.L. Pande, M.P.S.S. Singh and N.K. Choudhary

Regional Medical Research Centre for Tribals (Indian Council of Medical Research), P.O: Garha, Jabalpur 482 003, Madhya Pradesh, India

KEY WORDS β-Thalassaemia. Abnormal Haemoglobin. Anaemia. Sindhi.

ABSTRACT The present study reports the prevalence rates of haemoglobinopathies among the Sindhi community of Jabalpur, Madhya Pradesh. High prevalence of β-Thalassaemia trait (20.7%) is observed in this community. HbD was found with the prevalence rate of 2.3% and Sickle haemoglobin was not found in this community. The prevalence of total anaemia was higher among the β-Thalassaemia traits of this community. The reduced mean red cell indices indicate the hypochromic microcytic anaemia among β-Thalassaemia traits.

INTRODUCTION

The thalassaemias are a heterogeneous group of disorders with genetically determined reduction in the rate of synthesis of one or more types (α, β) of normal adult haemoglobin polypeptide chains. â -Thalassaemia occurs in two forms. β-Thalassaemia major (total suppression of β-chain synthesis) and β-Thalassaemia trait (Mild condition & suppression of β - chain synthesis is much less severe). Thalassaemia and other haemoglobin disorders like sickle cell haemoglobin are reported to be common in central India, especially in Madhya Pradesh (Bhatia and Rao, 1986; Gupta et al., 1991; Pande et al., 1992; Bhasin et al., 1994; Pande et al., 1999; Bhasin and Walter, 2001). We have observed many cases of β -Thalassaemia in heterozygous form among the Sindhi community of Jabalpur who were referred by various clinics. Thus this study was undertaken among Sindhi community of different areas of Jabalpur city to estimate the prevalence rate of β -Thalasaemia. According to the elders of this community, they were migrated from Sindh area, which is now in Pakistan and most of these are engaged in business.

MATERIALS AND METHODS

A total of 511 blood samples from the individuals of Sindhi community in different areas of Jabalpur city have been collected randomly in EDTA vials for screening of β -Thalassaemia and other haemoglobinopathies. Hb%, HCT, TRBC, MCV, MCH, MCHC were done by Sysmex-820 semi-automatic blood cell counter. Haemolysates were prepared and Hb electrophoresis was carried out on cellulose acetate membrane with TEB buffer at pH 8.6. HbA_2 was quantified by column chromatography to diagnose the β -Thalassaemia trait (Dacie and Lewis, 1991).

RESULTS AND DISCUSSION

The prevalence of β -Thalassaemia and other abnormal haemoglobins among Sindhi community of Jabalpur city is shown in table 1. The prevalence of β -Thalassaemia trait was 20.7%. Comparatively it was higher than all other populations of this area (Pande et al., 1999). Sickle cell haemoglobin was not found in this community. HbD, which is common in northwest

Table 1: Prevalence of haemoglobinopathies among the Sindhis community of Jabalpur (N=511)

Disease	*Percentage*
β-Thalassaemia trait	20.7 (106)
b-Thalassaemia major	0.2 (1)
Hb D	2.3 (12)
Hb S(sickle haemoglobin)	0

Table 2: Anaemia status among Sindhi community of Jabalpur

	Percentage of total anaemia (Mild+ Moderate+ Severe)	
	β -Thalassaemia trait (N=106)	*Normal (AA) (N=388)*
Male	56.8 (25)	17.4 (26)
Female	86.4 (38)	67.0 (130)
Children	77.8 (14)	57.8 (26)
Total	72.6 (77)	46.9 (182)

(Numbers in parenthesis are no. of samples)

Table 3: Haematological Parameters of β–Thalassaemia trait individuals of Sindhi community

Group	*Mean ± SD*						
	Hb(g/dl)	*HCT(L/L)*	*TRBC(10^{12}/L)*	*MCV(fl)*	*MCH(pg)*	*MCHC(g/dl)*	*Hb A_2(%)*
Male	13.2 ± 1.8	0.41 ± 0.05	5.6 ± 1.1	72.2 ± 15.9	23.5 ± 5.5	33.2 ± 2.9	4.8 ± 1.0
Female	10.6 ± 1.6	0.33 ± 0.04	5.2 ± 0.7	64.0 ± 13.0	20.7 ± 4.8	32.9 ± 3.2	4.8 ± 0.8
Children	10.8 ± 1.3	0.34 ± 0.03	5.5 ± 0.6	62.3 ± 10.4	20.1± 4.1	32.1 ± 1.8	4.9 ± 0.9

Table 4: Haematological Parameters of β–Thalassaemia major individual of Sindhi community

Age/sex	*Hb(g/dl)*	*HCT(L/L)*	*TRBC(10^{12}/L)*	*MCV(fl)*	*MCH(pg)*	*MCHC(g/dl)*	*Hb A_2(%)*	*Hb F(%)*
6 months/Male	4.0	0.16	3.0	52.8	13.3	25.2	4.8	43.6

India, was detected (2.3%) in this Sindhi community. HbD do not cause any clinical symptoms. There was only one case of β-Thalassaemia major (6months/Male). Table 2 shows the anaemia status of β -Thalassaemia traits and genetically normal individuals of Sindhi community. The prevalence of total anaemia was higher among all-sexual groups of β -Thalassaemia traits, when compared to genetically normal (AA) subjects. The red cell indices of β -Thalassaemia trait, β -thalassaemia major are given in the table 3 and 4. The mean values of MCV, MCH, and MCHC among β -thalassaemia traits indicate the prevalence of hypochromic microcytic anaemia among β -Thalassaemia individuals.

Although there are several studies of sickle cell haemoglobin in this study area, the studies regarding the β -Thalassaemias are very limited. β -Thalassaemia trait is usually a very mild disorder with mild or no anaemia, no symptoms and normal life expectancy. If both parents are β -Thalassaemia trait, they will have chance of 25% to get the β -Thalassaemia major child at each pregnancy. In spite of high prevalence (20.7%) of β -Thalassaemia trait, this community needs the counseling and health education regarding inherited disorders before marriage and needs to avoid the marriage between two traits. High-risk couples (Both are traits) should go for prenatal diagnosis and selective termination of homozygous β -Thalassaemia foetus.

ACKNOWLEDGEMENTS

The authors are grateful to ICMR and RMRCT for providing facilities. The authors are also thankful to the staff of Biochemistry department of RMRCT, Jabalpur for their assistance and to the Sindhi community for their cooperation.

REFERENCES

Bhasin, M. K., Walter, H. and Danker-Hofe, H.: *People of India: An Investigation of Biological Variability in Ecological, Ethno-economic and Linguistic Groups*. Kamla-Raj Enterprises, Delhi (1994).

Bhasin, M.K. and Walter, H.: *Genetics of Castes and Tribes of India.* Kamla-Raj Enterprises, Delhi (2001).

Bhatia, H.M. and Rao, V.R.: *Genetic Atlas of Indian Tribes*. Pub. Institute of Immunohaemotology (ICMR), Bombay (1986).

Dacie, J.V. and Lewis, S.M.: *Practical Haematology*. 7th Ed. Churchill Livingstone, London (1991).

Gupta, R.B., Tiwary, R.S., Pande, P.L., Kultar, F., Oner, C., Oner, R. and Huisman, T.H.D.: Haemoglobinopathies among the Gond tribal groups of central India. Interaction of alpha and beta thalassaemia with beta chain variants. *Haemoglobin*, **15:** 441-458 (1991).

Pande, P.L., Gupta, R.B. and Tiwary, R.S.: A study of sickle cell haemoglobin and glucose-6-phosphate dehydrogenase deficiency among the tribals of Madhya Pradesh. *Man in India*, **72:** 485-490 (1992).

Pande, P.L., Singh, M.P.S.S., Das, Ujwala, Godbole, S. and Tiwary, R.S.: Prevalence of haemoglobinopathies among different populations of Jabalpur, Madhya Pradesh. *J. Hum. Ecol.,* **10(5-6):** 439-440 (1999).