

Glucose-6-Phosphate Dehydrogenase Deficiency Among Thoti of Andhra Pradesh

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by International Committee for Standardization in Haematology (Beutler et al., 1979).

INTRODUCTION

In India, a number of investigators have reported varying incidences of sex linked recessive trait Glucose-6-phosphate dehydrogenase deficiency in various parts of the country (see Bhasin et al., 1992, 1994 for an excellent synthesis).

The present paper reports the incidence of glucose-6-phosphate deficiency among Thoti, a primitive endogamous tribal population of Andhra Pradesh. The population consists of 1306 persons as per the census report of 1981 and a majority of them (64 per cent) live in Adilabad district alone. Adilabad district situated between 77° 46' and 80° 0' of the eastern longitude and 18° 40' and 19° 56' of northern latitude forms the northern most part of Andhra Pradesh. It is bounded on the north by Yeotmal and Chanda districts of Maharashtra, on the south by Karimnagar and Nizamabad districts of Andhra Pradesh, on the east by Chanda and on the west by Nanded district of Maharashtra.

Thoti is a satellite community of Gond tribal population. Basically they are the bards. During religious ceremonies, they visit the Gond families and sing songs in praise of Gond gods and recite the stories of mythical origin of Gond and their clan gods. For this service, they are paid in cash or kind, usually with fixed quantity of agricultural product. The Thoti women practise tattooing.

MATERIALS AND METHODS

Blood samples were collected from 397 individuals (188 males and 209 females). The samples were collected by finger prick method in sterile stoppered tubes containing EDTA. Screening for G-6-PD deficiency was performed by employing fluorescent spot test recommended

RESULTS AND DISCUSSION

Gender wise distribution of G-6-PD deficiency among the Thoti has been set out in table 1. It is observed from this table that 5.85 per cent of the males were G-6-PD deficient whereas only 0.96 per cent of women were deficient for this enzyme. The cumulative percentage of deficient was 3.27 per cent. There was a significant dif-

Table 1: Distribution of G-6-PD deficiency among Thoti of Adilabad District, Andhra Pradesh

Sex	No. tested	Normal number	Deficient number	Allele frequency
Male	188	177 (94.15)	11 (5.85)	Gd+ = 0.9415 Gd- = 0.0585
Female	209	207 (99.04)	2 (0.96)	Gd+ = 0.9904 Gd- = 0.0096

$\chi^2 = 7.48$; significant

ference ($\chi^2 = 7.48$) between the two sexes in the incidence of G-6-PD deficient. The Gd- frequency in males was 0.0585 whereas it was only 0.0096 in female Thotis. Though Andhra Pradesh has a number of different tribal population, including twelve primitive tribal groups, only a few have been screened so far for this trait (Bhasin, et al., 1992, 1994). In all cases only males were included in the study. Bhasin and Walter (1998) in a comprehensive zone-wise evaluation of G-6-PD deficiency in India have thus summarised the position, "The frequency is comparatively higher in North and West India zones, which indicates a considerable stability of this allele in these areas, whereas in South India, it is uniformly low except in Andhra Pradesh and Tamil Nadu and from East India the studies are too few to evaluate". The Andhra tribals show a range of zero per cent in Pradhans

Table 2: Distribution of G-6-PD deficiency among primitive tribal groups of India

State	Population	Sex	Number Tested	Allele frequency (%)		Reference
				Gd+	Gd-	
Rajasthan	Saharia	Male	50	78.0	22.0	Jain et al., 1984
Maharashtra	Katkari	Female	77	92.2	7.8	Kate et al., 1979a
	Katkari	Female	296	89.5	10.5	Kate et al., 1979b
Tamil Nadu (Nilgiri Hills)	Irula	Male	89	91.0	9.0	Saha et al., 1976
		Female	81	95.1	4.9	
	Kurumba	Male	16	87.5	12.5	Saha et al., 1976
		Female	23	92.3	7.7	
	Todas	Male	48	100.0	0.0	Saha et al., 1976
		Female	50	100.0	0.0	
Andhra Pradesh	Thoti	Male	188	94.1	5.9	Present study
		Female	209	99.0	1.0	

to 3.56 in Koya Dora (Rao and Goud, 1979). Out of the 73 identified primitive tribal groups of India, other than the present study, only 5 have been screened for this enzyme deficiency (Table 2). It is interesting to note that in all primitive tribal populations, except Todas where it is absent, G-6-PD deficiency is present in a very high frequency. The present study, the first on any primitive tribe from Andhra, is no exception, where the males show a Gd- frequency of 5.85 per cent.

REFERENCES

- Bhasin, M.K., Walter, H.: Glucose-6-phosphate dehydrogenase deficiency and abnormal haemoglobins (S and E) in people of India. *J. Hum. Ecol.*, **9**: 339 (1998).
- Bhasin, M.K., Walter, H. and Danker-Hopfe, H.: *The Distribution of Genetical, Morphological and Behavioural Traits among the Peoples of Indian Region*. Kamla-Raj Enterprises, Delhi (1992).
- Bhasin, M.K., Walter, H. and Danker-Hopfe, H.: *People of India. An Investigation of Biological Variability in Ecological, Ethno economic and Linguistic Groups*. Kamla-Raj Enterprises, Delhi (1994).
- Census of India 1981. Series I. India Paper 1 of 1982 *Final Population Totals*. Controller of Publication, Delhi (1983).
- Jain, R.C., Choubisa, S.L., Acharya, A., Andrew, A.M.R., Chhaparwal, J.K. and Joshi, K.C.: Incidence of G-6-PD deficiency in the tribal population of southern Rajasthan. *J. Assoc. Physicians India*, **32**: 266 (1984).
- Kate, S.L., Mukherjee, B.N., Malhotra, K.C., Phadke, M.A., Mutalik, G.S. and Sainani, G.S.: Red cell glucose-6-phosphate dehydrogenase deficiency and haemoglobin variants among ten endogamous groups of Maharashtra and West Bengal. *Hum. Genet.*, **44**: 339 (1978a).
- Kate, S.L., Mutalik, M.G., Phadke, M.A., and Sainani, G.S.: Sickle cell haemoglobin and G-6-PD deficiency in tribal groups of Maharashtra. *Volume 2*: 89. In: *Medical Genetics in India*. I.C. Verma (Ed.), Auroma Enterprises, Pondicherry (1978 b).
- Rao, P.R. and Goud, J.D.: Sickle cell haemoglobin and glucose-6-phosphate dehydrogenase deficiency in tribal population of Andhra Pradesh. *Ind. J. Med. Res.*, **70**: 807 (1979).
- Saha, N., Kirk, R.L., Shanbhag, S., Joshi, S.R. and Bhatia, H.M.: Population genetic studies in Kerala and the Nilgiris (South West India). *Hum. Hered.*, **28**: 175 (1976).