

Haptoglobin and Caeruloplasmin Types in Five Tribal Populations of Andhra Pradesh

P. Veerraju, T. Venkateswara Rao, N. Lakshmi and S. Reshmi

INTRODUCTION

Inherited characteristics of human blood have been extensively used in delineating population differences. India's population structure is remarkable in that the population is divided into enumerable castes and tribes which are strictly endogamous. Tribes constitute around eight percent of the total Indian population (Bhasin, 2001). They usually reside in isolated and often marginal regions of India (Puppala and Crawford, 1996). Tribal languages resemble those of the major regional linguistic phyla spoken in groups that surround them (Sirajuddin, 1994). The distribution of Haptoglobin (Hp) and caeruloplasmin (Cp) protein systems in five tribal populations namely Konda Reddy (KR), Koya Dora (KD), Konda Kammara (KK), Chenchu (C) and Lambada (L) is presented here.

MATERIALS AND METHODS

Blood samples were collected intravenously from 231 healthy, unrelated individuals of both sexes (KR 45, KD 59, KK 28, C 49, L 50). The samples which were collected into test tubes containing EDTA solution as anticoagulant were centrifuged and clear plasma was separated from them. The samples were then typed for Hp and Cp by electrophoresis in polyacrylamide gels (Clark, 1964).

KR, KD and KK samples were from Rampachodavaram Mandal of East Godavari district whereas, C and L samples were from Mannanoor Mandal of Mahaboobnagar district.

Gene frequencies were calculated using gene counting method.

RESULTS AND DISCUSSION

Table 1 presents the distribution of phenotypes and allele frequencies of Hp in the five study populations. All the three phenotypes 1-1, 2-1 and 2-2 are observed in all five populations.

None of the five populations showed null allele. The highest frequency of 2-2 is observed in KR (64.44%) while the lowest is observed in KD (40.68%). Very low frequency of Hp¹ is observed in Lambadas (2%).

KD, KK and C are in the state of genetic equilibrium. Significant heterogeneity is found between the five populations ($\chi^2_8 = 17.74$; $0.05 > p > 0.02$). Considering all the populations together they are heterogeneous.

Hp² allele in Andhra Pradesh tribal populations ranges (Bhasin et al., 1992) from 72.9% in KK (Walter et al., 1981) to 94.5% in Yanadi (Reddy et al., 1982). KD of the present study has the lowest value 63.56%. All the other four populations are on the lower side of the range.

Considering the Cp system it is found to be monomorphic (Cp^B) in all the five populations investigated. So far no Cp variant has been described in any population (tribal/caste) of Andhra Pradesh (Bhasin et al., 1992).

ACKNOWLEDGEMENT

We gratefully acknowledge the financial support extended by Department of Biotechnology (DBT), New Delhi, for part of this work.

KEY WORDS Protein Systems. Tribal Groups. Andhra Pradesh.

ABSTRACT Haptoglobin and Caeruloplasmin protein systems have been determined in five tribal populations namely, Konda Reddy, Koya Dora, Konda Kammara, Chenchu and Lambada. The results were also compared with those available from other Andhra Pradesh populations.

REFERENCES

- Bhasin, M.K., Walter, H. and Danker-Hopfe, H.: *The Distribution of Genetical, Morphological and Behavioural Traits Among the People of Indian Origin*. Kamla-Raj Enterprises, Delhi (1992).
- Bhasin, M.K. and Walter, H.: *Genetics of Castes of Tribes of India*. Kamla-Raj Enterprises, Delhi (2001).
- Clark, J.T.: Simplified "Disc" (Polyacrylamide gel)

Table 1: Hp system in five tribal populations

Population	n	Phenotype			Allele frequency	
		1-1	2-1	2-2	HP ¹	HP ²
Konda Reddy	45	6 (13.33)	10 (22.22)	29 (64.44)	0.2444 $\chi^2_1=6.226$	0.7556 0.02>p>0.01
Koya Dora	59	8 (13.56)	27 (45.76)	24 (40.68)	0.3644 $\chi^2_1=0$	0.6356
Konda Kammarra	28	4 (14.29)	7 (25.00)	17 (60.71)	0.2679 $\chi^2_1=3.71$	0.7321 0.10>p>0.05
Chenchu	49	3 (6.12)	21 (42.86)	25 (51.02)	0.2755 $\chi^2_1=0.338$	0.7245 0.70>p>0.50
Lambada	50	1 (2.00)	27 (54.00)	22 (44.00)	0.2900 $\chi^2_1=4.32$	0.7100 0.05>p>0.02

electrophoresis. *Ann. N. Y. Acad. Sci.*, **121**: 428-436 (1964).

Puppala, S. and Crawford, M.H.: Genetic structure and phylogeny of populations of India: Andhra Pradesh. *Homo*, **47**: 73-84 (1996).

Reddy, A.P., Mukherjee, B.N., Malhotra, K.K., Das, S.K. and Ramachandraiah, T.A.: serological and biochemical genetic study among the coastal and plateau Yanadis: A tribal population of Andhra Pradesh. *Homo*, **33**: 174-182 (1982).

Sirajuddin, S.M., Duggirala, R. and Crawford, M.H.: Population structure of the Chenchu and other South Indian tribal groups: Relationship between genetic, anthropometric, dermatoglyphic and linguistic distances. *Hum. Biol.*, **66**: 865-884 (1994).

Walter, H., Pahl, K.P., Hilling, M., Veerraju, P., Goud, J.D., Naidu, J.M., Babu, M.S. and Jaikishan, G.: Genetic markers in eight endogamous population groups from Andhra Pradesh (South India). *Z. Morph. Anthropol.*, **72**: 325-338 (1981).

Authors' Address: P. Veerraju, T. Venkateswara Rao, N. Lakshmi and S. Reshmi, Department of Human Genetics, Andhra University, Visakhapatnam, 500 003, Andhra Pradesh, India