

Blood Groups in Two Sub-Populations of Rellis of Coastal Andhra Pradesh

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ABSTRACT The results of A_1A_2BO , RhCcDEe and MNSS blood group typings in two endogamous sub groups of Rellis, a Scheduled Caste population of Coastal City of Visakhapatnam in Andhra Pradesh are reported and compared with other population groups of the state.

INTRODUCTION

The Indian populations are stratified into various castes and tribes bound together by social factors, thus offering an excellent opportunity for genetic studies. The present investigation reports the distribution of blood group markers A_1A_2BO , RhCcDEe and MNSS among two endogamous sub groups of Rellis, a Scheduled Caste population of coastal city of Visakhapatnam, Andhra Pradesh.

The Rellis occupy the lowest stratum in the Hindu caste hierarchy. The origin of Rellis is not clear. They are a migrant group from the neighbouring state in Orissa migrated probably to Andhra Pradesh about one and a half centuries ago. They are presently divided into two traditional endogamous sub divisions, namely the fruit vendor group (Relli-I) and scavenger group (Relli-II). However, presently some of their members are involved in a variety of other jobs.

MATERIAL AND METHODS

A total of 227 blood samples from two sub groups of Rellis (Relli-I : 117; Relli-II : 110) belonging to both sexes from different localities of Visakhapatnam were collected intravenously in sterile test tubes containing ACD solution as an anticoagulant. Blood typings of the samples were performed

promptly, using anti- A_1 , - A_2 , -B, -C, -D, -E, -c, -e, -M, -N, -S and -s. Suitable controls were employed in all the serological tests. The gene and chromosome frequencies were calculated after Mourant et al. (1976).

RESULTS AND DISCUSSION

Phenotype frequencies for blood group systems investigated among Rellis are shown in table 1, and gene or chromosome frequencies in table 2.

A_1A_2BO System

The sub groups of Rellis show higher frequency of B allele (Relli-I : 17.42%; Relli-II : 21.32%) than that of A allele (Relli-I : 14.46%; Relli-II : 11.15%). This trend also observed in the pooled material, is in agreement with that generally observed in the earlier reports on caste populations of Andhra Pradesh (Naidu et al., 1990).

With regards to sub types of A group, the frequency of the A_1 allele is higher (Relli-I : 11.04%; Relli-II : 8.37%) than that of the A_2 allele (Relli-I : 3.42%; Relli-II : 2.78%). The A_1 and A_2 allele frequencies of Rellis fall with in the range of other Andhra caste populations.

The chi-square test for goodness of fit between observed and expected phenotype numbers is statistically non-significant in both the sub groups of Rellis (Relli-I : χ^2 1.9344; d.f. = 2; $0.20 > P > 0.10$; Relli-II : χ^2 0.4463; d.f. = 2; $p \approx 0.80$) as well as for pooled data χ^2 = 0.7736; d.f. = 2: $0.70 > p > 0.50$), indicating that the two sub populations of Rellis are in Hardy-Weinberg equilibrium for A_1A_2BO sys-

Table 1 : Phenotype distribution of blood groups among the Rellis

System/ Phenotype	Relli-I		Relli-II		Rellis (Pooled)	
	No. Obs.	% Obs.	No. Obs.	% Obs.	No. Obs.	% Obs.
<i>A₁A₂BO</i>						
O	56	47.86	50	45.45	106	46.70
A ₁	18	15.38	14	12.73	32	14.10
A ₂	6	5.13	5	4.54	11	4.85
B	29	24.79	37	33.64	66	29.07
A ₁ B	7	5.98	3	2.73	10	4.40
A ₂ B	1	0.86	1	0.91	2	0.88
Total ¹	117	100.00	110	100.00	227	100.00
<i>RhCcDEe</i>						
CCDEE	2	1.71	2	1.82	4	1.76
CCDEe	6	5.13	7	6.36	13	5.73
CCDee	40	34.19	50	45.45	90	39.65
CcDEE	3	2.56	3	2.73	6	2.64
CcDEe	14	11.97	12	10.91	26	11.45
CcDee	33	28.21	20	18.18	53	23.35
ccDEE	1	0.85	1	0.91	2	0.88
ccDEe	7	5.98	4	3.63	11	4.85
ccDee	11	9.40	10	9.09	21	9.25
ccdee	0	0.00	1	0.91	1	0.44
Total	117	100.00	110	99.99	227	100.00
<i>MNSs</i>						
MMSS	5	6.25	7	9.93	12	7.74
MMSSs	12	15.00	5	6.66	17	10.97
MMss	11	13.75	14	18.67	25	16.13
MNSS	7	8.75	5	6.66	12	7.74
MNSSs	11	13.75	8	10.67	19	12.26
MNss	18	22.50	15	20.00	33	21.29
NNSS	4	5.00	5	6.66	9	5.81
NNSSs	4	5.00	8	10.67	12	7.74
NNss	8	10.00	8	10.67	16	10.32
Total	80	100.00	75	99.99	155	100.00

Table 2 : Allele/chromosome frequencies of blood group systems among Rellis

System/ Allele	Relli-I	Relli-II	Relli-(pooled)
<i>A₁A₂BO</i>			
A ₁	0.1104	0.0837	0.0944
A ₂	0.0342	0.0278	0.0338
B	0.1742	0.2132	0.1875
O	0.6812	0.6753	0.6843
<i>RhCcDEe</i>			
CDE	0.0439	0.0472	0.0455
CDe	0.5847	0.6482	0.6297
cDE	0.0648	0.1119	0.0135
cDe	0.3066	0.1346	0.2450
cde	0.0000	0.0581	0.0663
<i>MNSs</i>			
MS	0.1525	0.1808	0.1980
Ms	0.4225	0.3525	0.3569
NS	0.2162	0.1858	0.1697
Ns	0.2088	0.2809	0.2754

tem. The inter-group chi-square test also shows non-significant differences ($\chi^2 = 3.2996$; d.f. = 5; $p \approx 0.70$) between the two sub groups.

RhCcDEe System

The ccdee phenotype was absent in Relli-I group only nine phenotypes out of possible eighteen phenotypes were found, while among Relli-II groups ten phenotypes were found. Concerning the chromosome frequencies, *CDe* recorded the highest frequency in both the sub groups (Relli-I : 58.47%; Relli-II : 64.82%). The same was true in other reports made earlier among Brahmins (Sri Kumari, 1985), Brahmins and Kammas (Naidu and Veerraju, 1982) and Hindus and Muslims (Roberts et al., 1980). Chromosome *cde* was absent in Relli-I group but present in Relli-II group in a moderate frequency (6.63%). It is worth pointing out here that most of the caste populations from Andhra Pradesh showed the absence of *CdE* chromosome except Brahmins (Sri Kumari, 1985) which too recorded a rather low frequency (1%).

The chi-square test for goodness of fit showed statistically significant values in Relli-I ($\chi^2 = 28.8309$; d.f. = 5; $p < 0.001$), Relli-II ($\chi^2 = 31.4593$; d.f. = 5; $p < 0.001$) and in pooled data ($\chi^2 = 21.5348$; d.f. = 5; $p < 0.001$) showing deviation from genetic equilibrium in both the sub groups as well as for the total material. The intergroup chi-square comparisons however showed non-significant differences between two subgroups of Rellis of the present study ($\chi^2 = 6.1618$; d.f. = 9; $0.80 > p > 0.70$).

MNSs System

It has been observed that *Ms* chromosome recorded highest frequency in both the sub groups (Relli-I : 42.25%; Relli-II : 35.25%).

Among other caste populations so far studied from Andhra Pradesh, the *Ms* incidence has been reported high, the highest was reported in Brahmin (53%; Naidu and Veerraju, 1982).

The chi-square test for goodness of fit indicated that both the sub groups (Relli-I : $\chi^2 = 19.0959$; d.f. = 5; $0.01 > p > 0.001$; Relli-II : $\chi^2 = 21.0636$; d.f. = 5; $p < 0.001$) as well as the pooled material ($\chi^2 = 23.1000$; d.f. = 5; $p < 0.001$) were not in genetic equilibrium for MNSs blood group system. However, the inter-group chi-square test showed non-significant differences between two sub groups of Rellis ($\chi^2 = 5.9446$; d.f. = 8; $0.70 > p > 0.50$) for this system.

Thus, it appears that the distribution of different blood groups in the Rellis, a Scheduled Caste population of Andhra Pradesh, is similar to that reported in other caste populations of the state.

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REFERENCES

- Mourant, A.E., Kopec, A.C. and Domaniewska-Sobczak, K.: *The Distribution of the Human Blood Groups and Other Polymorphisms*. Oxford University Press, London, 2nd Edition (1976).
- Naidu, J.M., Yasmin and Sachi Devi, S.: Further data on ABO and Rhesus blood groups among Andhra populations. *J. Hum. Ecol.*, 1:153-54 (1990).
- Naidu, J.M. and Veerraju, P.: Blood groups among Brahmins and Kamma caste populations of coastal Andhra Pradesh. *Amer. J. Phys. Anthropol.*, 58 : 197-199 (1982).
- Roberts, D.F., Papiha, S.S., Rao, G.N., Habeebullah, C.M., Kumar, N. and Murthy, K.J.R.: A genetic study of some Andhra Pradesh populations. *Ann. Hum. Biol.*, 7: 199-212 (1980).
- Srikumari, C.R.: *A Study of Natural Selection and Genetic Adaptation Among the Four Endogamous Sub-populations of Andhra Pradesh*. Ph. D. Thesis, Andhra University, Waltair (1985).