

Distribution of A1A2BO and Rh Blood Group among the Rajputs and Warlis of Naroli Village Panchayat, Dadra and Nagar Haveli

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ABSTRACT Blood groups and other biochemical markers are genetically controlled traits that are suitable for studying population variation, as they are not subjected to environmental influence. The present paper reports the distribution of A1A2BO and Rh blood groups among the Rajputs and Warlis of Dadra and Nagar Haveli. The frequency of blood group O is found to be highest with high frequency of Rh+ve in both the populations. A non-significant difference is found in the observed and expected frequencies indicating both the populations are in Hardy-Weinberg equilibrium. When compared with the other available data of western India, the frequencies of A1A2BO and Rh blood groups among the Rajputs and Warlis are within reported range of frequencies.

INTRODUCTION

Population genetics as a branch of genetics aims at the genetic composition of biological populations, and the changes taking place in it. Population geneticists pursue their goals by developing abstract mathematical models of gene frequency dynamics, trying to extract conclusions from those models about the likely patterns of genetic variation in Mendelian populations, and testing the conclusions against empirical data. Genetic variations between inter and intra populations are studied in terms of polymorphism of various genetic markers. In physical anthropology, population genetic is concerned with the frequencies and interaction of various genetic markers in human population and factors involved in it. As the study of variation within and between the populations is one of the main objectives of physical anthropologists, the characters, which are not subjected to the environmental influence, are the obvious choice. In this regard blood groups and other biochemical markers are the best known genetically controlled traits in human population genetics. The significance of such studies lies in that the ethno-historical, mythological and other related records in association with genetic data can be used to demonstrate the origin of a population and also genetic relationship between populations. In the present study, an attempt has been made to study the distribution of A1A2BO and Rh blood groups among the Rajputs and Warlis of Naroli gram Panchayat, Dadra and Nagar Haveli.

MATERIAL AND METHODS

Dadra and Nagar Haveli is situated between the latitude and longitude of 20° to 20°25' North and 72°50' to 73°15' East respectively. Located on the western side of the foothills of Western Ghats, the union territory covers an area of 491 sq km with 72 villages (3 in Dadra and 69 in Nagar Haveli), though administratively it is divided into 11 village gram Panchayats. According to 2001 census, the total population of the territory is 220,490 with more than 62% of tribal populations. The prominent population groups inhabiting in this territory are caste communities such as Rajput, Ahir, Chamar, Mahar, etc. and the main tribes are Warlis, Dhodia Kokna, etc. The populations under study i.e. Rajput and Warlis, both practice endogamy with gotra exogamy.

A total blood sample of 206 from unrelated individuals of either sexes (103 from each population) were collected through finger prick method, and analyzed for A1A2BO and Rh blood groups using standard techniques as described by Bhasin and Chahal (1996). Gene frequencies were calculated after Mourant et al. (1976). The details of each subject such as name, age, sex, caste etc. were also collected.

RESULTS AND DISCUSSION

A1A2BO and Rh Blood Groups: The frequency distribution of phenotypes and alleles of A1A2BO and Rh blood group systems among the Rajputs and Warlis are given in table 1 and 2,

Table 1: Phenotype and allele frequencies distribution of A1A2BO and Rh blood groups among 103 Rajputs of Dadra and Nagar Haveli

Phenotype	Observed No. (%)	Expected No.	Allele frequencies
<i>A1A2BO Blood Groups</i>			
O	57 (55.3)	55.69	$ABO*A1=0.1129$
A1	17 (16.5)	18.54	$ABO*A2=0.0057$
A2	1 (1.0)	0.87	$ABO*B=0.1461$
B	23 (22.3)	24.33	$ABO*O=0.7353$
A1B	5 (4.9)	3.40	
A2B	0 (0)	0.17	
<i>Rh Blood Groups</i>			
Rh+	102 (99.03)	-	$RH*D=0.9015$
Rh-	1 (9.85)	-	$RH*d=0.0985$

Table 2: Phenotype and allele frequencies distribution of A1A2BO and Rh blood groups among 103 Warlis of Dadra and Nagar Haveli

Phenotype	Observed no. (%)	Expected no.	Allele frequencies
<i>A1A2BO Blood Groups</i>			
O	41 (39.81)	41.344	$ABO*A1=0.1189$
A1	17 (16.50)	17.376	$ABO*A2=0.0167$
A2	3 (2.91)	2.214	$ABO*B=0.2309$
B	36 (34.95)	35.628	$ABO*O=0.6335$
A1B	6 (5.83)	5.655	
A2B	0 (0)	0.793	
<i>Rh Blood Groups</i>			
Rh+	103 (100.00)	-	$RH*D=0.1000$
Rh-	0 (0)	-	$RH*d=0.0000$

respectively. It has been observed that the frequency of O blood group is highest in both populations with percentage frequency of 55.3% and 39.81% in Rajput and Warlis, respectively. It is followed by B blood group with percentage frequency of 22.3% and 34.95%, respectively, in both populations. A2 blood group is found with the least percentage frequency in both populations. Among the Rajputs, the allele frequency of O (73.53) is highest followed by B (14.61), A1 (11.29) and A2 (0.57), respectively. And among the Warlis, O has the highest allele frequency with 63.35 followed by B (23.09), A1 (11.89) and A2 (1.67), respectively. The differences between observed and expected frequencies show statistically non-significant differences, indicating that both the populations are in Hardy-Weinberg equilibrium.

In the present study, the frequency of allele $ABO*O$ has been reported highest followed by $ABO*B$, which shares similar pattern of frequency distribution of A1A2BO blood group, as described by Bhasin et al. (1994) in the Western India.

In the presently studied populations, the allele $RH*D$ is found in very high frequency with percentage frequency of 90.15 in Rajput and absolute 100 percent in Warlis. In general, the frequency of allele $RH*D$ varies from 53.2% to 100.0% among Indians which averages around 80.3%. This $RH*D$ frequency is found to be highest among the tribes as compared with other communities (Bhasin and Walter 2001). In the present study also, Warlis, a tribal population has more frequency of $RH*D$ than Rajput, which follows the generally expected pattern of Rh blood group distribution among the tribes.

It has been observed that both populations have high allele frequency of $ABO*O$. $ABO*B$ is found to be higher than $ABO*A$, following a similar pattern of distribution that has been reported by previous studies from the populations of western India. On the whole, it has been observed that the frequencies of A1A2BO and Rh blood groups among the Rajput and Warlis are within the reported range of frequencies of western India.

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REFERENCES

- Bhasin MK, Walter H, Danke-Hopfe H 1992. *Distribution of Genetical, Morphological and Behavioral Traits among the Peoples of Indian Region*. Delhi: Kamla-Raj Enterprises.
- Bhasin MK, Walter H, Danke-Hopfe H 1994. *People of India, An Investigation of Biological Variability in Ecological, Ethno-economic and Linguistic Groups*. Delhi: Kamla-Raj Enterprises.
- Bhasin MK, Chahal. SMS 1996. *A Laboratory Manual for Human Blood Analysis*. Delhi: Kamla-Raj Enterprises, Delhi.
- Bhasin MK, Walter H 2001. *Genetics of Castes and Tribes of India*. Delhi: Kamla-Raj Enterprises.
- Dadra and Nagar Haveli 2004-2005. *Socio Economic Development of Dadra and Nagar Haveli since its Liberation*, Administration of Dadra and Nagar Haveli; Deptt. of Planning and Statistics, Silvassa.
- Mourant AE, Kopec Ada C, Domaniewska-Sobczak K 1976. *The Distribution of the Human Blood Groups and Other Polymorphisms*. London: Oxford University Press. 2nd Edition.