

Distributions of A_1A_2BO and Rh blood group among Gonds and Panikas of Madhya Pradesh

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KEYWORDS Blood Groups. Genetic Polymorphism. Tribal Groups.

ABSTRACT The present study deals with the distribution of A_1A_2BO and Rh blood groups among Gonds (107) and Panikas (115) of Anuppur district and Dindori district of Madhya Pradesh. The phenotypic frequency of blood group B was found to be higher among Gonds, whereas blood group O in Panikas. The phenotypic frequency distribution of Rh (D) antigens is higher than that of Rh (d) among both of the populations. However, allelic frequency distribution of Rh^*D and Rh^*d was found to be more or less similar among both of the populations.

INTRODUCTION

Blood is a specialized connective tissue and has a number of functions in human body such as homeostasis to maintain the internal environment of the body constant, transportations of gases, nutrients and endocrinal secretions, distribution of heat and clotting (Maurant 1954). The frequency of ABO and Rh blood groups in different population groups of India has been extensively studied (for details see Bhasin et al. 1992). In the present study, frequency distribution of A_1A_2BO and Rh blood groups among Gonds and Panikas of Madhya Pradesh has been studied.

MATERIAL AND METHODS

A total of 222 blood samples (Gonds-107 and Panikas-115) were collected from unrelated individuals from various schools and villages of Anuppur district and Dindori district of Madhya Pradesh. Blood typing and allele frequency calculations were done according to Bhasin and Chahal (1996).

RESULTS

In the present paper, among Gonds, blood group B was found to be highest in frequency

(33.64%), which is followed by O blood group (29.90%), whereas, frequency of blood group O is found to be highest (37.38%) among Panikas, followed by blood group B (27.88%). In both the tribal groups, the distribution of allele frequency was found almost similar ($ABO^*O > ABO^*B > ABO^*A_1 > ABO^*A_2$). The value of D/σ is found to be high among Gonds (2.67) as compared to the Panikas ($D/\sigma = 0.23$) which show the differences in observed and expected frequencies. Hardy-Weinberg equilibrium in Gonds ($\chi^2 = 10.83$, $p = 0.002 > p > 0.005$) is observed significant (Table 1).

The phenotypic frequency distribution of Rh blood group was calculated among both of the populations and Rh-ve was found to be higher among Gonds (8.42%) as compared to Panikas (1.74%) (Table 2).

DISCUSSION

Distribution of ABO and Rh blood group system showed ethnic and geographic variation in India. Blood group O is found to be commonest, followed by B group and A group among Southern region of the country which is in agreement with our study (Periyavan et al. 2010). Moreover, present study shows similar distribution pattern of ABO blood group with neighbouring populations of Madhya Pradesh and other adjoining states (Mukherjee et al. 1990). Low incidence of the A_2 is in agreement with earlier findings (Chaudhary and Sharma 2010). High occurrence of O blood group among the studied populations may be due to the smaller population size or selection of O blood group in malarial endemic regions as evidenced from different studies (Singh et al. 2014). On the whole,

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Table 1: Genotypic and allelic frequency distribution of A₁A₂BO blood groups in Gonds and Panikas of Madhya Pradesh

Gonds (N=107)				Panikas (N=115)			
Phenotype	Observed No. (%)	Allele frequency		Phenotype	Observed No. (%)	Allele frequency	
A ₁	15(14.02%)	ABO*A ₁	0.17	A ₁	31(26.96%)	ABO*A ₁	0.18
A ₂	4 (3.07%)	ABO*A ₂	0.02	A ₂	1(0.87%)	ABO*A ₂	0.02
B	36 (33.64%)	ABO*B	0.31	B	32(27.83%)	ABO*B	0.19
A ₁ B	19 (17.76%)			A ₁ B	7(6.09%)		
A ₂ B	1 (0.94%)			A ₂ B	1(0.87%)		
O	32 (29.90%)	ABO*O	0.55	O	43(37.38%)	ABO*O	0.61
χ ² =10.82,DF=2,p=0.002>p>0.005				χ ² =0.96, DF=2, p= 0.2>p>0.1			

Table 2: Genotypic and allelic frequency distribution of Rh (D) blood group in Gonds and Panikas of Madhya Pradesh

Phenotype	Gonds (N=107)		Phenotype	Panikas (N=115)	
	Observed No. (%)	Allele frequency		Observed No. (%)	Allele frequency
Rh +ve	98(91.58%)	Rh*D=0.92	Rh +ve	113(98.26%)	Rh*D=0.98
Rh -ve	9(8.42%)	Rh*d=0.08	Rh -ve	2(1.74%)	Rh*d=0.02

both the tribal groups of the present study show similar trend in the distribution of allelic frequencies with respect to ABO blood group system (ABO*O>ABO*B>ABO*A), as in the various Indian populations (Bhasin and Walter 2001).

In general the frequency of Rh*D varies from 0.532 to 0.100 among Indians. The Rh*D was found to be higher among the tribal populations of India in comparison to other communities according to Bhasin and Walter (2001). The present paper data also have the similar pattern of Rh*D distribution as other tribal populations of the country (Bhasin and Walter 2001). Low frequency of Rh*d allele in the present paper supports the earlier findings from different tribal population groups of Madhya Pradesh (Bhasin et al. 1992). However, both ABO and Rh blood group shows statistically significant difference between the studied populations indicating preservation of its own gene pools even residing in the same geographical region.

In brief, uniform allele frequency distribution patterns of A₁A₂BO and Rh observed in this paper suggests a genetic proximity of the selected populations with other population groups of India. However, it needs to be proved with different evolutionary genetic markers.

ACKNOWLEDGEMENTS

Researchers are thankful to Prof. V.R. Rao, Dr. B. Murry, Tabitha Panmei and H. Sureskumar

Singh for their kind support and help. Researchers are also grateful to all the Lab colleagues of Molecular Anthropology Laboratory, Department of Anthropology, University of Delhi and to all the individuals who volunteered to participate in this study.

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