

Distribution of ABO and Rhesus Blood Alleles in a Strict Endogamous Sub-tribe of Lower Sindh (Pakistan): Setharani (Tribe: Noohani)

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Abstract. The population genetic studies on a small sub-tribe of 50 strictly endogamous individuals, *i.e.*, Setharani (tribe Noohani) settled in southern Sindh (Pakistan) suggest a typical allelic frequencies of Rh (D=1.0, d = 0.0) and ABO (A = 0.58, B = 0.05, O = 0.40). This frequency is different from main Noohani tribe, settled in the northern Sindh and other populations of Sindh. The blood groups appearing in different individuals can be conventionally explained on a polyallelic inheritance for ABO-blood locus. Th strict endogamy exercised in the tribe does not appear to cause any ill effect.

Keywords: ABO blood groups, Rh factor, allelic frequencies, pedigree.

INTRODUCTION

The blood alleles are genetic markers and exhibit different distribution in different human populations. Their distributions have been used in working out the genetic differences between different populations and are important from anthropological point of view (Islam and Khan, 1978). The allelic frequencies of ABO and Rh blood groups have been reported for many populations of the world, including Iraq (Islam and Khan, 1978), Saudi Arabia (Bashwari *et al.*, 2001), India (Bhattacharjee and Kumar, 1969; Hurkat *et al.*, 1971) and Pakistan (Rathore *et al.*, 1993; Mian *et al.*, 1985; Mian and Bhutta, 1993; Bhatti and Sheikh, 1998, 1999). The present paper reports the distribution of ABO and Rh blood groups alleles in an isolated population an endogamous tribe settled in Sindh Palasta, *i.e.*, Setharani (Noothni), settled near Jamshoro (Hyderabad).

MATERIALS AND METHODS

Noohani tribe is an endogamous tribe settled in the hilly areas of Khirthar mountains in southern Sindh (Pakistan). They are believed to have migrated from Egypt through Iran some 250 years ago. They are Muslims and are chiefly engaged in agriculture and dairy farming. A sub-population of the tribe, called Setharani, is settled in two closely

located villages, *i.e.*, Jhangara-Bajara and Jamshoro University Campus.

All the living members, both males and females (total 50) of the sub-population under study were approached and their blood collected, by pricking finger, and tested with high titre of anti-A, anti-B and anti-D antibodies (Gamma Biological Inc. 1995) using slide agglutination method at room temperature. Allelic and genotypic frequencies and their standard deviations were calculated believing that the population was in Hardy-Weinberg Equilibrium, using methods of Mather (1957).

The pedigree chart of the family was constructed, using the information available with different members of the family and conventional symbols.

RESULTS

Out of 50 individuals tested for blood groups 40 (80%) belonging to A, 2 (4%) to B, 8 (16%) to O and none to AB blood group. The allelic frequencies for A, B and O alleles have been calculated as: 0.58 ± 0.07 , 0.05 ± 0.10 and 0.40 ± 0.10 (Table I).

All the individuals were found to be Rh-positive. No Rh-negative individual has been observed in the present populations. The calculated frequency of D allele is 1.00 and d=0.00.

The distribution of the blood groups in different individuals of the pedigree can be conveniently explained on a poly allelic inheritance for ABO blood groups (Fig. 1).

1 1st lady aged 120, died recently 2 One of the child was suffering from megaloblastic anemia 3 The uncle to this child died of stomach cancer

Fig. 1. Pedigree of the Setharani (Noohani) sub-tribe of Sindh showing the distribution of A, B, AB and O blood groups.

Table I.- Phenotypic frequencies and the calculated alleles and expected genotypic frequencies in sub-cast setharani (Tribe Noohani).

Phenotype				Genotype			
Class	No. observed	Percent observed	Class	Frequencies \pm SD	Class	Expected frequencies	Expected phenotypic frequencies
A	40	80.0	A=p	0.58 \pm 0.06	AA	0.34	0.80
B	2	4.0	B=q	0.05 \pm 0.01	AO	0.46	
AB	0	-	-	-	BB	0.0025	0.04
O	8	16.0	O=r	0.40 \pm 0.01	BO	0.04	-
					AB	0.06	0.06
Total	50	-	-	1.03	OO	0.16	0.16
					-	1.00	1.06

DISCUSSION

The present study has been carried out on a sub-tribe of Noohani tribe, *i.e.*, Setharani (others being Randani and Gabrani, settled in other parts of Sindh). The population under the present study is a small population of 50 living individuals settled in two small villages, isolated from the other populations and maintaining a high degree of endogamy with a very strict pattern of intermarriages within sub-tribe. The population exhibits very characteristic frequencies of the two blood group alleles under the present study. There is a total absence of d-allele of Rh-blood locus and a very low frequency of B-allele of ABO-locus. No comparative study is available on the distribution of the Rh-alleles for the other ancient populations of Sindh. However, complete absence of the recessive d-alleles in the population appears of special interest and needs further investigations.

The allelic frequencies of ABO-blood alleles (A = 0.58, B = 0.05, O = 0.40) exhibited by the Setharani (Noohani) tribe, under the present study is different than that exhibited by the main Noohani tribe (A = 0.27, B = 0.27, O = 0.43; Bhatti and Shaikh, 1998). The allelic frequencies of Abro tribe (A = 0.41, B = 0.37, O = 0.37; Bhatti and Sheikh, 1999) runs comparatively close to that exhibited by Setharani tribe with regard to the frequency of O-allele, though it differs significantly with regard to the frequency of B-allele. The setharani tribe stands out with reference to a higher frequency of A-allele, though in most of the Indian populations the

frequency of O-allele is the highest, ranging between 0.60 and 0.70 (Bhatti and Sheikh, 1998; Mian and Bhutta, 1993; and many others). The complete absence of AB individuals can hardly be explained on the present information, except for chance factor attributable to smaller size of sample. The observed alleles frequencies may suggest a non-random population mainly arising from inbreeding in a small population.

The general observations on the family suggest that though the Setharani tribe is a very endogamous group of small population and a high degree of inbreeding is expected, yet the frequency of the abnormalities caused by the recessive alleles is very low. Only a single case of megaloblastic anaemia (2% of population) was reported. All the individuals of the family are healthy. No comparative study is available on the inbreeding and its effects in the populations of Sindh, yet there appears a little effect of the inbreeding or genetic drift in the genetically isolated populations. Further studies in this population shall be interesting to analyze the effects / degree of consanguinity and its effects in human populations.

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