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Distribution of Serological and Biochemical Markers in the Keer Tribe of Madhya Pradesh

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Abstract : The Present genetic study provides baseline data on the Keer tribe inhabiting Sehore district of Madhya Pradesh. A total of 131 blood samples were collected and typed for variabilities of the A_1 A_2 BO and Rh (D) blood groups and isozymes of Adenosine Deaminase (ADA), Phosphoglucomutase locus1(PGM1), Esterase D (ESD) and Acid Phophatase locus 1(ACP1) as well as Haemoglobin (HB). The Chi square test for goodness of fit revealed no significant deviation between the observed and expected numbers in any of the seven genetic markers, suggesting that the tribe is in genetic equilibrium. The present study among the Keer shows a high incidence of the *B* allele and low of the A_1 allele with absence of the A_2 allele as well as a low $\underline{d}$ (Rh negative allele) frequency in serological markers. In biochemical traits, the frequency of the PGM1*2, was recorded rather low and no variant of blood protein HB was found. Thus, the present study helped in genetically characterizing the Keer tribe of Madhya Pradesh.

Key words : Enzyme Polymorphism, Blood groups, Keer tribe, Madhya Pradesh.

Introduction :

The Central India State of Madhya Pradesh (M.P.) is home to as many as 45 small or big tribes, the most numerous being the Gond and Bhil. The Keer tribe having a strength of 15, 333 (Census, 1991) is found only in Sehore and Raisen districts of the state. Although serological studies are available on some of these tribes (Bhasin *et al*., 1992), there is paucity of data on biochemical genetic markers (Chahal *et al*., 1985, 1986; Papiha *et al*., 1978; Saha and Goswami, 1987). It is therefore that the present investigation was planned to provide the baseline data on various blood genetic markers in the Keer tribe of M.P.

Material and Methods :

A total of 131 blood samples were collected at random into EDTA.K_2 treated vials from unrelated Keer subjects of Makodia, Unchakhera, Ninor and Chaura villages of Budhni tehsil of Sehore district of Madhya Pradesh. The quantity of blood samples from the each individual was about 0.5 ml. The samples were personally transported to Patiala in wet ice. In laboratory at Patiala, samples were analyzed for phenotypes of the A_1A_2BO and Rh (D) blood groups by tube method. Haemolysate were prepared using freezing and thawing method and stored at -20 C in a freezer pending enzyme typing using biochemical technique of electrophoresis and specific staining protocols, hemolysates were typed for isozymes of red cell enzymes viz. Adenosine Deaminase (ADA) Phoshoglucomutase locus 1 (PGM1), Esterase D (ESD), Acid Phophatase locus 1 (ACP1) and Hemoglobin (HB) (Bhasin and Chahal, 1996).

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Table 1 : Phenotypes and allele frequencies in the Keer tribe.

Genetic system	n		Phenotypes						Allele ferquencies		χ^2 (H.-W.)
			0	A_1	A_2	B	A_1B	A_2B			
A_1A_2BO	131	Number observed	47	10	-	66	8	-	O =	0.5927	0.771
		Number expected	46.02	11.60	-	67.16	6.22	-	A_1 =	0.0705	
									A_2 =	0.0000	
									B =	0.3368	
Rh (D)	131	Number observed	Rh(D)+ 130	Rh(D)- 1					D =	0.9126	
									d =	0.0874	
ADA	131	Number observed	104	26	1				ADA*1=	0.8931	0.208
		Number Expected	104.49	25.01	1.50				ADA*2=	0.1069	
PGM 1		Number observed	95	33	3				PGMI*1=	0.8511	0.005
		Number Expected	94.89	33.20	2.90				PGMI*2=	0.1489	
ESD	131	Number observed	73	44	14				ESD*1=	0.7252	3.244
		Number Expected	68.89	52.21	9.89				ESD*2=	0.2748	
			A	A,B	B						
ACP1	130	Number observed	14	58	58				*ACP1*A* =	0.3308	0.048
		Number Expected	14.23	57.56	58.22				*ACP1*B* =	0.6692	
HB	129	Number observed	A 129						Hb*A=	1.0000	

Results and Discussion :

The distribution of the two blood groups and five biochemical markers studied in the Keer tribe are presented in Table 1. The Chi-square ($\div^2$) test for goodness of fit revealed no significant deviation between the observed and expected numbers in any marker, suggesting the tribe is in genetic equilibrium.

In the A_1A_2 BO system blood group B was found most preponderant while A_1 incidence was much lower. In terms of allele frequencies the value of *B* and A_1 in the Keer were estimated to be 0.3368 and 0.0705 respectively, which are the highest and lowest recorded incidence of these two alleles in any tribal population of Madhya Pradesh. Also noteworthy was the absence of A_2 allele. As for as the Rh (D) blood groups, only a single example of Rh (D) negative was found, giving and incidence of 0.0874 for the *d* allele. This corroborates earlier reports of the low frequency of the allele in tribes of Madhya Pradesh (Bhasin *et al*., 1992.)

Electrophoretic typings of ADA, PGM1, ACP1 and ESD showed great variation in these red cell enzyme polymorphism in the Keer tribe while blood protein hemoglobin (HB) was found to be monomorphic. In each of the five enzyme systems considered, all possible common phenotypes were found but no example of any rare variant was encountered. The allele frequencies were: ADA*2 = 0.1069, PGM1*2 = 0.1489, ESD*2 = 0.2748and ACP1*A =0.3308. The comparative values reported in the Bhil tribe of Jhabua district of Madhya Pradesh are 0.079, 0.296, 0.262 and 0.199 respectively (Pahiha *et al*., 1978). It is interesting to note that the frequency of the PGM 1*2 allele in the Keer is just half of the value reported in the Bhil and that of ACP1*A much higher than that of the Bhil.

Conclusion :

The present genetic study demonstrated a high incidence of the *B* allele and low of the A_1 allele with absence of the A_2 allele as well as a low d frequency in serological makers while in biochemical traits the frequency of the PGM1 2 was recorded rather low and no variant of blood protein HB was found in the Keer tribe. The results of this study have helped characterize the Keer tribe of Madhya Pradesh (M.P.) genetically. Further such studies are urgently required to bring as many as possible of various tribes of the M.P. on genetic map of India before they lose their ethnic identities because of rapid modernization and development..

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