

BRIEF COMMUNICATIONS

**A Blood Group Survey in the Oraons of Purnia District, Bihar,
India**

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ABSTRACT The present study reports the distribution of the ABO blood groups among the Oraons of Purnia District, Bihar. There is a predominance of blood group A in this tribe, and the allelic frequencies are in the order O>A>B. Geographical variation of this blood group system in Oraons has been discussed.

INTRODUCTION

Blood groups in man are excellent traits of population genetic studies. They are useful in describing man's evolutionary history and in characterising differences among populations. The distribution of blood group genes shows a wide range of variation in terms of both geographical areas as well as different population groups of the world.

The tribal population in India with its diverse ethnic strains furnishes a unique material for the study of blood group variation. The distribution of the ABO blood groups is known in much more detail than that of any other systems. Although several tribes have been examined for this polymorphic system from India, there is no report on the tribes of Northern Bihar. Keeping this in mind, the present work, which deals with the ABO blood groups typing of Oraons of Purnia District was undertaken.

Oraons are the second major tribe of Bihar as well as of Purnia District (Roy, 1915). They are strictly endogamous. They speak the dialect "Karkuh" of Dravidian origin with close connection to Tamil and Konkani of South India (Ridley, 1891; Grierson, 1905; Howells, 1937). Although Guha (1951) considered Oraons to be related to the "Proto- Austroloid" (described

previously as "Pre-Dravidian" and "Veddoid"), it is generally believed that they migrated from Southern India and settled in Bihar several centuries ago and eventually moved to Chotanagpur (Roy, 1915; Prasad, 1961).

MATERIAL AND METHODS

For the present investigation the blood samples were collected from different villages of Purnia District. The majority of the material was obtained by means of door to door visits.

The ABO typing was done by slide agglutination method, within six hours of collection.

The ABO gene frequencies were calculated according to Moutant et al. (1976). Chi-square values were calculated after Woolf (1957).

RESULTS AND DISCUSSION

The results are shown in table 1. In the present investigation of Oraons of Purnia District, the incidence of blood group A was highest (44.4%) and that of AB was lowest (9.40%); the frequencies of B and O groups (22.2% and 23.9%, respectively) occupy an intermediate position. The frequencies of alleles A, B, and O are 32.34, 17.46 and 15.19%, respectively. From the figure 1 it is clear that :

1. Allele A increases with time,
2. Allele B declines with time, while
3. Allele O remain and almost constant.

Previous studies on the Oraons of Chotanagpur plateau have revealed the predominance of blood group B (Sarkar, 1949; Kirk et al., 1963; Sharma, 1976). However, Bhatia et al. (1986) reported a high incidence of blood group A in the Oraons of Ambikapur (Madhya Pradesh). In both the migrant Oraons of Jalpaiguri District of West Bengal (Piplai et al., 1985) and in the immigrant Oraon labourers of Andaman (Lehmann and Ikin, 1953), blood group B was observed in highest proportions.

It has been reported that there is a considerable relation between geography and the distribution of blood groups. In their Irish study, Bittles and Smith, (1991) have reported abrupt changes in A and O allele frequencies against distance moving from north to south. Commencing from the northernmost town in the Peninsula (Bangor), the greatest discontinuity in the allele frequency line occurs around the historical boundaries separating the lower and upper Ards. They further reported considerable correlation between genetic and geographic distance matrices. Purnia district is located in Purnia division at a distance of about 350 km north of Chotanagpur Plateau. The high frequency of blood group A observed in the Oraons of present study might be due to their geographical isolation since they have migrated to Purnia about 300 years ago in the draught of first decade of 18th Century (1708) from Chotanagpur Plateau. Sharma et al. (1985) have reported higher frequency of blood group O while in other studies high incidence of blood group B has been reported in Kond tribe of Orissa. They pointed out that these minor variations are evidently due to geographical isolation despite common ancestry. Thus it may be concluded that the predominance of blood group A in the Oraons of Purnia district might be due to their geographical isolation, despite Oraons of Chotanagpur plateau and Purnia both having common ancestry.

According to Wright (1934), the identical gene frequencies of isolated small populations become different with time because of genetic drift. He has suggested that the smaller the population, the greater will be the importance of genetic drift, its influence being negligible in very large populations. Further, he has pointed out that if a small number of plants or animals colonise on isolated habitat, all the alleles present in the original population may not be represented in the new population, but will be at different frequencies from those in the main population. This may result in strikingly distinct forms. With a change in environmental conditions, the small population may develop a superior pool of genes which would give it an advantage over its ancestors. Thus the chance variation of gene quantity brought about through genetic drift can have evolutionary significance. Oraons of Purnia are migrants from Chotanagpur Plateau and are present in smaller numbers.

Furthermore they are strictly endogamous and their mating takes place within the geographical area of Purnia division. The higher frequency of blood group A recorded in present Oraons might be due to chance variation of gene quantity brought about through genetic drift and which might be a selective advantage in their present environmental conditions in comparison to predominance of blood group B in the Oraons of Chotanagpur Plateau. Such type of variations in blood groups have been found in the Dunkers of Eastern Pennsylvania who had immigrated over 200 years ago from West Germany (Glas, 1953).

The goodness of fit chi-square test shows that the Oraons of Purnia are homogeneous in respect of the ABO blood group distribution ($\chi^2 = 2.95$, $d.f.3$; $0.50 > p > 0.30$). The contingency chi-square tests between Oraons of Purnia and Ranchi (Kirk et al., 1963) ($\chi^2 = 9.7$; $d.f.3$; $0.05 > p > 0.02$), and between oraons of Purnia and Jalpaiguri (Piplai et al., 1985) ($\chi^2 = 11.24$; $d.f.3$; $0.02 > p > 0.01$) show statistically

Table 1: ABO blood group and allele frequencies of Oraons

Place	Phenotypes					Allele Frequencies			Reference
	n	O	A	B	AB	A	B	O	
Palamau	115	26.09	27.83	33.91	12.17	22.52	26.55	50.93	Sarkar (1949)
Andaman South (Immigrant)	100	19.00	25.00 ²	38.00	18.00 ⁴	24.29	33.37	42.34	Lehmann & Ikin (1953)
Ranchi	125	26.60	28.80	38.40	7.20	20.00	27.00	53.00	Kirk et al. (1963)
Ambikapur	478	25.94	34.51 ²	30.54	8.99 ³	26.30	23.70	49.90	Bhatia et al. (1986)
Jalpaiguri	119	21.10	22.72 ¹	40.34	10.92 ³	23.43	31.76	44.81	Piplai et al. (1985)
Purnia	117	23.93	44.44	22.22	9.40	32.34	17.46	50.19	Present study

1. A₁ 2. A₁ + A₂ 3. A₁B+A₂B 4. A₁B

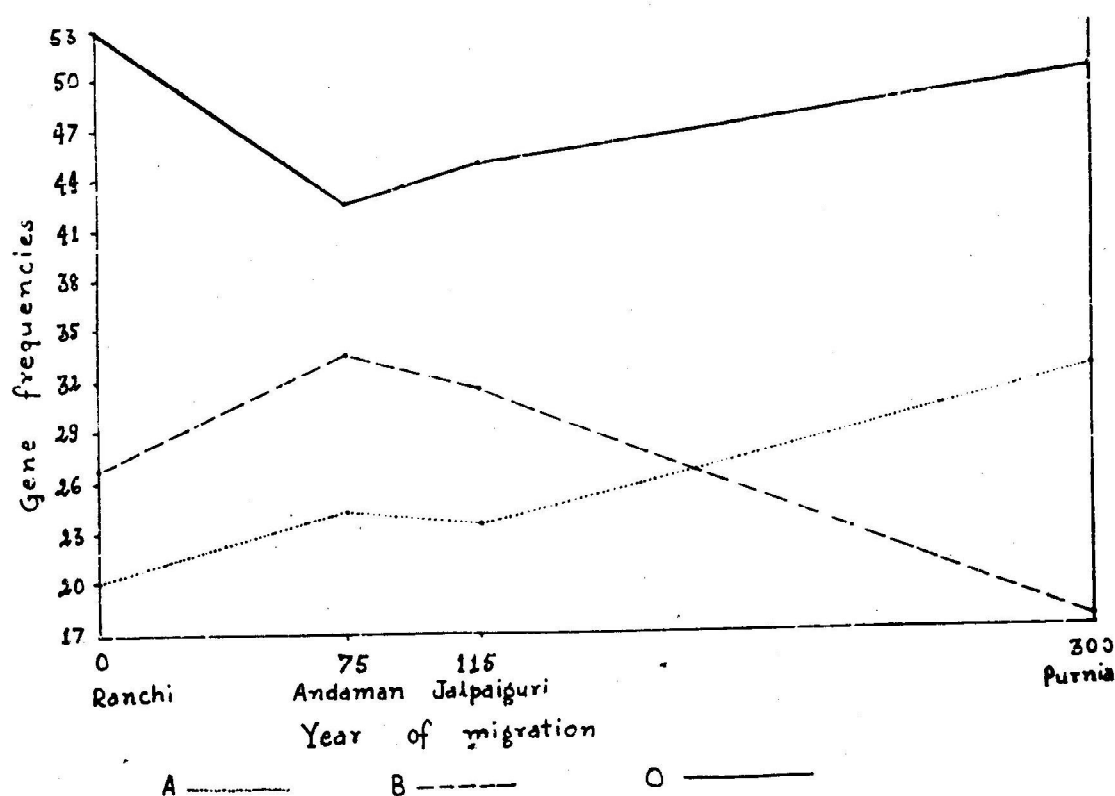


Fig. 1. Comparative frequencies of allele A, B and O along with years of migration in Oraons of Ranchi, Andaman, Jalpaiguri and Purnia

significant differences as regards the variation in the character in question. But the Oraons of Purnia and Ambikapur (Bhatia et al., 1986) having ($\chi^2 = 4.9$; $d.f.3$; $0.20 > p > 0.10$) show statistically significant difference. Thus, it may be concluded that Oraons of Purnia, Ranchi and Ambikapur have common ancestry inspite of differences in blood group frequencies, which might be due to geographical isolation, temporal variation and genetic drift etc.

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