Allelic Frequency of ABO And Rh D Blood Group Among The Banjara Backward Caste of Yavatmal District, Maharashtra , India

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Number of text pages: 10 Number of references: 11 Number of Table: 02

ABSTRACT

The distribution of ABO blood groups and Rh(D) factor has been studied among the Banjara of Backward population of Yavatmal (Maharashtra). The A, B, O and AB blood group percentage were recorded as 24.54%, 33.82%, 29.64% and 12% respectively. The allele frequencies of O, A, B and AB groups in the combined data were found to be 0.5354, 0.2022 and 0.2624 respectively. The distribution of Rh(D) group varies among the ABO blood groups. The Rh(D) positive allelic frequency was 0.8405 and the Rh(D) negative incidence was recorded as 02.55% in the studied population.

KEY WORDS: Blood Group, Rh Factor, Gene Frequency, Banjara, Yavatmal.

INTRODUCTION

The ABO blood group distribution varies in different geographical and ethnic groups. ABO blood group genes are mapped at 9q34.2. In present paper, we study the distribution of ABO blood group and Rh factor among the Banjara population of Yavatmal district, Maharashtra.

Banjaras originally belong to Rajasthan and they were Rajputs who migrated to southern parts of India for trade and agriculture. They settled down in the southern or central area of the country and slowly loosened contacts with Rajasthan, and their original community. Over a period of time both the communities separated and they adopted the local culture, the dialect spoken by Banjaras settled in Yavatmal district of Maharashtra is an admixture of Hindi, Rajasthani and Marathi. The word "Banjara" must have evolved from Prakrit and Hindi and Rajasthani words "Bana/Ban or Vana/Van" meaning Forest or Moorlands and Chara meaning 'Movers'. The Banjara are (together with the Domba) sometimes called the "Gypsies of India" (Kamat, 2007).

During the last five decades, numerous studies have been carried out on the distribution of blood groups and genetic composition of various endogamous population groups in India (Bhasin et al. 1992; 1994). The ABO blood types are not found in equal numbers. In Caucasians in the United States, the distribution is type O, 47%; type A, 41%; type B, 9%; and type AB, 3%. Among African American, the distribution is type O, 46%; type A, 27%; type B, 20%; and type AB; 7%. Among Western Europeans, 42% have group A, 9% group B, 3% group AB and the remaining 46% group O (Pramanik and Pramanik, 2000).

Rh – D distribution also varies worldwide. Rh-D negative blood group is documented as 5.5% in south India, 5% in Nairobi, 4.8% in Nigeria, 7.3% in Lahore,

7.7% in Rawalpindi (Mwangi, 1999; Omotade et al., 1999; Bhatti and Amin, 1996). About 95% of African – Americans are Rh-positive whereas indigenous Africans are virtually 100% Rh-positive.

The present study is carried out to record the phenotypic and genotypic frequency of alleles in the blood groups of Banjara of the population of the Yavatmal district (Maharashtra). The study has suggested that the blood group frequencies of this region are similar to the Asian communities (Lyko, J et al., 1992), in the series of B>O>A>AB, with the highest allele frequency of Rh positive in the studied Banjara populations. These figures are reported in the hope that they may be used as reference for studies of ABO blood groups by health planners, while making an effort to face future health challenges in this region.

MATERIALS AND METHODS

Blood Samples from a total of 550 unrelated individuals of both sexes were drawn from the Banjara (Backward caste) settlements of Yavatmal district of Maharashtra. Blood samples were taken from finger pricks, and the samples were analyased for ABO and Rh (D) blood groups following Race and Sanger (1962) with the antisera procured from Haffikine Institute, Bombay. Gene frequencies are calculated by Hardy-Weinberg principle using the Win Bug program (Spiegelhalter, et al., 2003).

RESULT AND DISCUSSION

Table 1 shows the distribution of the ABO blood group and their allelic frequencies among the Banjara (Backward caste) population of Yavatmal District, Maharashtra. It is clear that the phenotype B has the highest phenotypic frequency (33.82 %) followed by O (29.64%), A (24.54%) and AB (12%). The overall series of phenotypic frequencies of ABO blood groups is phenotype B>O>A>AB. It shows phenotype B is dominant to phenotype O, A, and AB in Banjara (Backward caste) population.

Table 1: Distribution of the ABO blood group and their phenotypic and allele frequencies among the Banjara (Backward caste) population of Yavatmal District, Maharashtra.

(Number of samples analyzed= 550)

Phenotype	Observed number	Phenotypic frequency in %	Expected Number	Allelic Frequency
A	135	24.54	141.51	A=0.2022
B	186	33.82	192.23	B=0.2624
O	163	29.64	157.67	O=0.5354
AB	66	12	58.59	
Total	550	100	550	1.000

The allelic frequency of phenotype A, B and O are (0.2022), (0.2624) and (0.5354) respectively. Phenotype O denotes dominant allelic frequency among all.

The decreasing order of allele frequency of phenotype O is (0.5354)> B (0.2624) > A (0.2022) in Banjara population. It is found that phenotype A has very less allelic frequency than phenotype B and phenotype O. The table also shows the observed number and expected number of ABO Phenotypes.

Table 2 determine the distribution of the Rh (D) blood group and their allele frequencies among Banjara (Backward caste) population of Yavatmal District**.** Rh (D) distribution also varies within Banjara population. In this study, it was observed that phenotype B Rh (D) positive phenotypic frequency is highest with percentage frequency 33.45% which is followed by phenotype O Rh(D) positive with the percentage frequency 28.55%, phenotype A Rh(D) positive percentage frequency 23.45 % and AB Rh(D) positive percentage frequency 12% (Table 2). In overall, the total percentage of Rh (D) positive was 97.45 % and Rh (D) negative was found to be 2.55%. The allele frequencies were recorded 0.8405 for D and 0.1595 for d.

Table 2: Distribution of the Rh(D) blood group and their allele frequencies among Banjara (Backward caste) population of Yavatmal District, based on ABO blood group (n= 550)

ABO blood group	Rh (D) +tive observed	Rh (D)-tive observed	Allelic Frequency
A	129 (23.45%)	6	D= 0.8405
B	184 (33.45%)	2	
O	157 (28.55%)	6	d= 0.1595
AB	66 (12.00%)	-	
Total	536 (97.45%)	14 (2.55%)	1.000

The distribution of allele frequencies of ABO and Rh(D) blood groups of Banjara population of Yavatmal district are found to be similar to that observed for

Kshatriya (Rajput) population of Uttar Pradesh (Pradeep kumar et. al. 2009). The data generated in the present study may be useful for health planners, while making efforts to face the future health challenges in the region. In short, generation of a simple database of blood groups, not only provides data about the availability of human blood in case of regional calamities, but also serves to enable insight into possibilities of future burden of diseases.

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