Gene frequencies of A1A2BO and Rh antigens among six populations of Jammu and Kashmir, India

Mohammad Fareed and Mohammad Afzal
Aligarh Muslim University, India

Background: ABO and rhesus (Rh) protein in human populations are used as the immunogenetic markers for anthropological, basic and applied medical studies. Identification of blood group antigen frequencies in a population has various benefits in transfusion medicine, transplantation and disease risk.

Objective: The aim of the study was to record gene frequencies of ABO blood groups, their subtypes and Rh antigen for six different endogamous groups.

Subjects and Methods: Nine hundred and ninety five (995) individuals irrespective of the age and sex were selected from six populations of J&K viz., Gujjar and Bakarwal (n=201), Mughal (n=155), Khan (n=151), Malik (n=155), Mir (n=160) and Syed (n=173). ABO blood groups and Rh antigens were tested by simple agglutination reactions on a clean slide by using specific antisera (Tulip Diagnostics; Goa, India). Genotypes and allele frequencies for each population were calculated by Hardy-Weinberg method and heterozygosity was determined.

Results: The ABO phenotypic frequency varies among six different populations showing significant difference (p<0.0005). Gujjar and Bakarwal (a tribal population) shows highest (42.29%) of B blood phenotypes. A1 is the highest among Syeds (39.31%), O blood group frequency highest among Mughals (43.23%) and A1B and A2B are rare phenotypes showing very low frequency among all populations. The pattern of allele frequencies (p<0.025) is inorder of IO>IB>IA1>IA2, except Syeds (IO>IA1>IB>IA2). The rhesus protein (Rh) phenotypic frequency (p<0.01) shows significant increase in Rh(D) positive (87.86% in Syed to 96.03% in Khan) among all populations. The Rh allele (p<0.05) and genotype (p<0.02) frequencies shows a significant difference. Heterozygosity for Rh protein is less than homozygosity among six populations. The result from this study provides information on the genetic variation in blood antigens and rhesus protein among human populations inhabiting Jammu and Kashmir. Bringing health awareness through information, education, and communication activities about blood and Rh related disorders can help in preventing many of the immunogenetic, hematological and transfusion problems.

mohdfareedk@gmail.com

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