

International Journal of Research and Development in Pharmacy and Life Sciences Available online at http//www.ijrdpl.com December - January, 2012-13, Vol. 2, No.1, pp 235-237 ISSN: 2278-0238

Research Article

DETERMINATION OF FREQUENCY OF OCCURRENCE OF ABO BLOOD GROUP IN SAGAR

Ila Gautam and J.D. Sharma

Department of Criminology and Forensic Science, Dr. H. S. Gour Central University, Sagar (M.P.) 470003, India

*Corresponding Author: Email: ilagautam2004@gmail.com

(Received: August 20, 2012; Accepted: November 23, 2012)

ABSTRACT

The present paper is the result of frequency of occurrence of ABO blood group carried out in Sagar (M.P.). The frequency of B blood group is highest with percentile frequency of 0.361 and lowest AB blood group with percentile frequency of 0.095. The x^2 test as well as D/ σ show significant values. **Keywords:** Physical evidence, Blood, Population Genetics, Blood Group typing, Frequency allele and Criminal activity

INTRODUCTION

Blood is the most common type of physical evidence found is variety of scenes of crime and in other criminal situations. If the frequency of occurrence of various blood groups in known in a particular population of a selected area, this help to interpret the data in more appropriate manner to corroborate and evaluate the findings of blood group analysis. This all can be determine with the help of population genetics.

The basic unit of study in population genetics is gene rather than the genotype or phenotype of an individual. Since a population is characterized by a set of allele frequencies, therefore such data are essential prerequisites for studying the frequency of occurrence on genetics of any trait like blood group is any population.

Human population genetics is the study of the nature and source of the inherited differences and involve predicting the changes that may take place in relative frequencies of different genes determining the conditions under which equilibrium between forces affecting their frequencies may be obtained.

In the present the most of the morphological characters are subjected to many intricate factors such as environment nutrition and cumulative effect of various genes. These traditional traits which were used to characterize typological units are becoming more and more confined to the elucidation of specific problems to which their use is immediately applicable, especially concerning with the scene of crime where blood is found as *corpus delict*. Human blood considered as vital fluid thus occupy a vital place of human genetics and of forensic serology as it is the most readily available tissue and physical evidence respectively. It is an established fact that most of the serological and biochemical characters have a distinct hereditary mechanism and so it is desirable that the blood group variability be measured in term of traits whose precise mode of inheritance is known.

The significance of this study lies in the fact that it describes the population in term of frequency allele within a limited area. It is hope that once their frequency alleles are recognized and recorded, these can further help in explaining the present day genetics structure of population as well as to interpret the blood group typing pertaining in any criminal activity.

MATERIAL AND METHODS

For the present study the data were collected from willingly individuals of Sagar (M.P.) 1000 samples were collected and analyzed for ABO blood group system. All the necessary precautions were taken for random sampling. The samples were analyzed for blood group ABO and test was prosecced by using Anti-A, Anti- B, Anti-H per ABO blood grouping. Cell suspension technique was used. Samples were collected in normal saline solution washed and analyzed in 3-5% suspension of red cells in saline. For ABO blood grouping slide method was used (Bhasin and Chahal, 1996). **RESULT AND DISCUSSION:-**

The frequency of occurrence of ABO blood group system was determined by taking blood sample from one thousand individual which is shown vide Table 1.1. It is observed from the Table 1.1 that the blood group B occurs with highest frequency percentile 0.361 followed by O blood group 0.325, A blood group 0.219 and AB blood group 0.095.

Table 1.1: Showing numbers of A, B, O and AB blood group individuals from thousand random selected individuals:

Blood Group	Number of individuals	Percentile Frequency
Α	219	0.219
В	361	0.361
ο	325	0.325
AB	95	0.095
Total	1000	

The allele frequency is calculated through to Bernstein formula and it was found for A blood group 0.1713, for B blood group 0.2618 and for O blood group 0.5709 in terms of p_c , q_c and r_c respectively. The expected frequency and

Table 1.2 Calculation of chi-square test for ABO bloodgroup system

Ph en otypes	Obse Numbers	rved Fregun cv	Expected ratio	Expected	Chi- sq vare test (x) ²
Α	219	0.219	2	224.8	0.15
в	361	0.361	3	367.4	0.111
0	325	0.325	3	325.9	0.002
AB	95	0.095	1	89.6	0.325
Total	1000				0.584

expected number are calculated with thesecorrected value of frequency alleles for A blood group, since possible genotypes of A blood group are AA and AO thus there expected frequency are calculated by $(pc)^2$ and 2(pr)and was found 0.2248 and expected number was 224.8 The expected frequency and expected number are calculated with these corrected value of frequency alleles for B blood group, since possible genotypes are BB and BO thus there expected frequency are calculated by $(q_c)^2$ and $2(q_r)$ and was found 0.3674 and expected number was 367.4. The O blood group has genotype OO thus its expected frequency was calculated by $(r_c)^2$ and was found 0.3259 and expected number was 325.9. The AB blood group has genotype AB thus its expected frequency calculated by 2(pq) and was found 0.0896 and expected number was 89.6 which was shown vide Table 1.2.

The value of $D/\sigma = 0.906$ which indicate that the population is under genetic equilibrium and value of $X^2 = 0.5842$ (Table 1.2) of degree of freedom one with probability 0.50 0.30 shows goodness of fit of the sample.

Determination of frequency of occurrence of any blood group is very important tool of population statistics. It is also very essential for forensic serologist as to help them to interpret the blood group analysis by typing of blood pertaining to any criminal activity.

REFERENCES

- Bhasin, M.K. and Chahal, S.M.S. : A Laboratory Manual for Human Blood Analysis. Kamla Raj Enterprises, Delhi (1996).
- Mourant, A.E., Kopee, A.C. and Domaniewska Sobezae, K. : The Distribution of Human Blood Groups and Other Polymorphisms, Oxford University Press, London (1976).
- Pattanayak, Ipsa : Distribution of A1A2B0 and Rh Blood Groups Among the Rajputs of Uttaranchal, Anthropologist, 8(2) : 139-140 (2006).

- Jain, Ajay : ABO blood group distribution in students of Dr. H.S.Gour Vishwavidhalaya Sagar (M.P.). Thesis pp. 9-25, (1984)
- Shrma K.K.N: A study of distribution of ABO blood group system and haemoglobin types among Jain's of Sagar. Thesis pp.20-40, (1994).