

## To study the ABO blood group discrepancy in healthy voluntary blood donors at SMS medical college jaipur

Dr Shailendra Singh

Junior Resident -3

Department of Immunohematology and Transfusion Medicine  
SMS Medical College Jaipur

Dr Kuldeep Jareda

Junior resident -3

Department of Immunohematology and Transfusion Medicine  
SMS Medical College Jaipur

Dr. Amit Sharma

Senior Professor and Head

Department of Immunohematology and Transfusion Medicine  
SMS Medical College Jaipur

Corresponding Author: Dr Kuldeep Jareda

---

### Abstract

**Background-** To study the ABO blood group discrepancy in patient healthy voluntary blood donors at SMS medical college jaipur

**Methods-** This is an observational, descriptive study of ABO blood group discrepancy in patients requiring blood transfusion and healthy donors at Department of immunohaematology and transfusion medicine SMS medical college, Jaipur from 1st august 2019 to 30 march 2020 till the designed sample size is achieved after approval from institutional ethical committee and research review board.

**Results-** In donor population the incidence of discrepancies were found to be 23 out of 7821 (0.29%). Out of the 23 discrepancies there were only males of which maximum number of donors were in an age group of 18-50 years (23 cases) There were no donors in an age group of >51 years with discrepancy. For an age group 18-30 there were 3 Cases, between 31-40 years there were 12 cases and between 41-50 years there were 8

**Conclusion-** The study on analysis of ABO discrepancies showed the incidence in donor population as 23 out of 7821 (0.29%).

**Keywords-** ABO, Discrepancies, RH.

---

Date of Submission: 05-06-2021

Date of Acceptance: 18-06-2021

---

### I. Introduction

ABO and Rhesus blood group system are clinically the most important. Blood Donors and patients must be correctly ABO and Rh grouped because transfusing ABO in-compatible blood may result in transfusion reaction which may lead even to death of the patient<sup>1</sup>

A genomic study done on 324 clinical samples involved in ABO discrepancy showed that number of definable alleles associated with ABO subgroups has increased from 14 to 29 than their earlier study<sup>2</sup>. Another study on analysis of ABO discrepancies in 35 French hospitals suggests that incidence of ABO discrepancy was 1 per 3400. This figure was 10 times higher than incidence of ABO mismatched transfusion<sup>3</sup>. In reports from Department of laboratory medicine in a National University, Korea chimerism and mosaicism are found to be important causes of ABO phenotype and genotype discrepancies by studying the STR (Short tandem repeat) loci by DNA-based techniques.<sup>4</sup>

### II. Materials And Methods

This is an observational, descriptive study of ABO blood group discrepancy in patients requiring blood transfusion and healthy donors at Department of immunohaematology and transfusion medicine SMS medical college, Jaipur from 1st august 2019 to 30 march 2020 till the designed sample size is achieved after approval from institutional ethical committee and research review board.

## Methods

### Inclusion Criteria

1. Patients of either gender and all age groups whose sample is received through blood requisition forms.
2. All the patient and donor samples, with EDTA or citrated anticoagulated blood for forward grouping and clotted blood samples for reverse grouping
3. Voluntary Blood donors who fulfill the criteria for blood donation(age>18, weight >50kg,Hb>12.5 gm%).
4. Patient and donors who are willing to participate in the study

### Exclusion Criteria

1. Patients and voluntary donors not willing to participate in the study.
2. Donors who are medically unfit.
3. Hemolysed samples
4. Clotted samples of new born upto 3 months of age for reverse grouping

### Statistical Analysis

All data obtained was entered, segregated and tabulated in micro excel software as per mentioned variables.

Statistical analysis was performed with SPSS, version 21 for windows statistical software package (SPSS inc., Chicago, IL, USA).

- Qualitative data was expressed in form of percentage and proportions. Significance of difference was inferred by Chi-square test.
- Quantitative data was expressed in the form of mean+/- standard Deviation.
- Significance of difference was inferred by t-test.
- Probability was considered to be significant if p value <0.05.
- Potential association between parameters was assessed by performing a correlation study.

## III. Result

Table 1: Donor Details

Month	No. of Donors	Discrepancies Noted	No Discrepancy
AUGUST	996	3	993
SEPTEMBER	1049	2	1047
OCTOBER	1025	1	1025
NOVEMBER	953	2	951
DECEMBER	969	4	965
JANUARY	988	5	983
FEBUARY	951	5	946
MARCH	890	1	889
TOTAL	7821	23	7798
STATS	Chi square=6.692	Degree of freedom=7	P value=0.4617

In donor population the incidence of discrepancies were found to be 23out of 7821 (0.29%).Out of the 23 discrepancies there were only males of which maximum number of donors were in an age group of 18-50 years (23 cases)There were no donors in an age group of >51years withdiscrepancy.Foranagegroup18-30 there were 3 Cases, between 31-40 years there were 12 cases and between 41-50 years there were 8

## IV. Discussion

This study was designed to determine the incidence and causes of all ABO discrepancies detected in a Sawai Man Singh Hospital Blood Bank. Blood Donors and Patients must be correctly ABO and Rh grouped because transfusing ABO in-compatible blood may result in transfusion reaction which may lead even to death of the patient <sup>1</sup>As a result of a study by Olsson et al, the number of definable alleles associated with weak ABO subgroups has increased from 14 to 29.<sup>2</sup> Linden and associates reported that incidence of ABO mismatched transfusion was 1 per 33,0003.. In donor population the incidence is 23 out of 7821 (0.29%).

Transcriptional error have been encountered in this study. There were 3 cases (8.6% of total discrepancy) of technical errors which were due to transcriptional errors. A study on analysis of ABO discrepancies in 35 French hospitals suggested that incidence of ABO discrepancy was 1 per 3400.This figure was 10 times higher than incidence of ABO mismatched transfusion<sup>(3)</sup>. They also found that most of these errors

were due to phlebotomy errors, that is collection from wrong patients. The second most common cause was found to be clerical errors which could be avoided only by standardizing data transmission<sup>5</sup> Strict adherence to the labeling requirements results in a significant decrease in erroneous blood grouping during the 17-year period addressed by a report by Dzik, et al who found an estimated rate of WBIT (*wrong blood in tube*) as 1 in 2,262 samples. Published reports cite an incidence of ABO discrepancy due to inappropriately identified specimens ranging from 1 in 517 to 1 in 3,400 samples<sup>6,7,8</sup> In a study to analyze preventable errors related to transfusion Sharma et al found that 86% occurred outside the blood bank and 13% in the bloodbank<sup>8</sup>

## V. Conclusion

The study on analysis of ABO discrepancies showed the incidence in donor population as 23 out of 7821 (0.29%).

## References

- [1]. Dr. R.N.Makroo. ABO Blood group system. Compendium of Transfusion Medicine. 1<sup>st</sup> edition. New Delhi, Alps Printers. 1999: 28-32.
- [2]. Olsson M L et al. Genomic analysis of clinical samples with serologic ABO blood grouping discrepancies. *Blood* 2001;98(5):1585-1593.
- [3]. Chiaroni J, Legrand D, Dettori I, Ferrera V. Analysis of ABO discrepancies occurring in 35 French hospitals. *Transfusion* 2004;44(6):860-4.
- [4]. Cho d et al. Chimerism and mosaicism are the important causes of ABO phenotype and genotype discrepancies. *Immunohematology* 2006;22(4):183-7.
- [5]. Priscilla I. Figueroa, Nearly Two Decades Using the Check-Type to Prevent ABO-Incompatible Transfusions. *Am J Pathol*:2006;126:422-426.
- [6]. Dzik WH, Murphy MF, Andreu G, et al. An international study of the performance of sample collection from patients. *Vox Sang*. 2003;85:40-47.
- [7]. Murphy MF, Steam BE, Dzik WH. Current performance of patients sample collection in the UK. *Transfus Med*. 2004;14:113-121.
- [8]. R.R. Sharma, S. Kumar & Agnihotri. Sources of preventable errors related to transfusion. *Vox Sanguinis*:2001(81):37-41.

Dr Kuldeep Jareda, et. al. "To study the ABO blood group discrepancy in healthy voluntary blood donors at SMS medical college jaipur." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(06), 2021, pp. 06-08.